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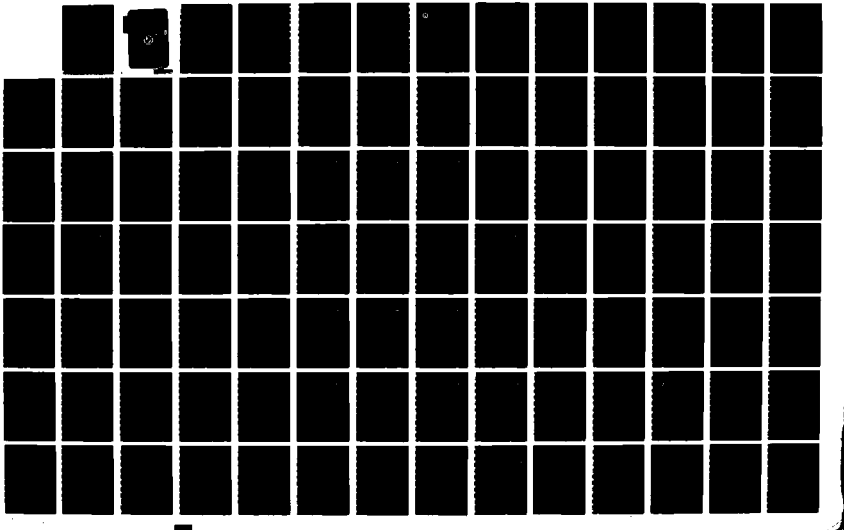

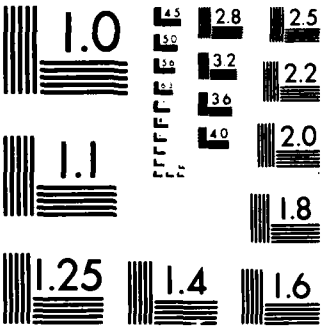

STUDY REPORT
CAA-SR-87-16

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NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT (NTCPE) STUDY

JULY 1987

PREPARED BY
FORCE SYSTEMS DIRECTORATE

US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814-2797

CAA

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Director
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National Training Center Prepositioned Equipment (NTCPE) Study

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05	03		

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

The purpose of the study was to conduct a cost analysis to compare the cost of prepositioning M1A1 tanks, Bradley Fighting Vehicles (BFVs), and combat support/combat service support (CS/CSS) equipment at the National Training Center (NTC) versus transporting from home station. The current plan for tanks, BFVs, and CS/CSS equipment was reviewed for FY 88-91. Cost estimates for the current plan and alternatives to the current plan were developed. Potential cost savings and training benefits with respect to transporting or prepositioning M1A1s, BFVs, and CS/CSS equipment were identified.

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STUDY REPORT
CAA-SR-87-16

NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT (NTCPE) STUDY

July 1987

Prepared by

FORCE SYSTEMS DIRECTORATE

US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20814-2797

DEPARTMENT OF THE ARMY
US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814-2797

REPLY TO
ATTENTION OF

0 4 AUG 1987

CSCA-FSL (5-5d)

MEMORANDUM FOR: Deputy Chief of Staff for Operations and Plans, ATTN: DAMO-TRS, Headquarters, Department of the Army, Washington, D.C. 20310-0450

SUBJECT: National Training Center Prepositioned Equipment (NTCPE) Study

1. Reference letter, DAMO-TRS, 16 December 1986.

2. Subject letter directed the U.S. Army Concepts Analysis Agency (CAA) to conduct a study to determine if it is less costly to preposition M1A1 tanks, Bradley Fighting Vehicles (BFV), and combat support/combat service support (CS/CSS) equipment at the NTC, or to transport from home station.

3. This final report documents the results of our cost analysis of prepositioning this equipment at the NTC, and provides qualitative considerations.

4. This Agency expresses appreciation to all commands and agencies which have contributed to this study. Questions and/or enquiries should be directed to the Assistant Director, Force Systems Directorate, U.S. Army Concepts Analysis Agency, 8120 Woodmont Avenue, Bethesda, MD 20814-2797, AUTOVON 295-1607.

E. B. Vandiver III

Encl

E. B. VANDIVER III
Director

CAA	**NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT (NTCPE) STUDY**	**STUDY SUMMARY CAA-SR-87-16**

THE REASON FOR PERFORMING THE STUDY was to conduct a cost analysis to compare the cost of prepositioning M1A1 tanks, Bradley fighting vehicles (BFVs), and combat support/combat service support (CS/CSS) equipment at the National Training Center (NTC) versus transporting from home station.

THE PRINCIPAL FINDINGS of the work reported herein are as follows:

(1) It is more costly to preposition M1A1s at the NTC than to transport from home station.

(2) Training suitability would be improved by prepositioning M1A1s at NTC.

(3) Accelerating planned positioning of BFVs at NTC would provide cost savings.

(4) Prepositioning CS/CSS equipment at the NTC would provide cost savings.

THE MAIN ASSUMPTIONS of this work are:

(1) Operations and support costs for all equipment used at NTC during training exercises will not impact on analysis.

(2) The rate of ammunition usage per battalion and ammunition costs per round will not change during the course of the study.

(3) Forces Command (FORSCOM), Army National Guard (ARNG), and US Army Europe (USAREUR) prepositioning of materiel configured to unit sets (POMCUS) modernization plans will be executed as currently planned.

(4) Single deck railcars, 90 feet in length, will be used to transport equipment to NTC.

THE PRINCIPAL LIMITATIONS of this work are that the study does not address the effectiveness of the training exercises at NTC, the potential impact on readiness, and minor cost elements.

THE SCOPE OF THE STUDY included a review of the current NTC rotation schedule, current and proposed tank fleets for use at the NTC, the scheduled delivery of BFVs to the NTC, and the financial impact of prepositioning a mix of CS/CSS equipment at NTC.

THE STUDY OBJECTIVES were to:

(1) Determine the potential cost savings and training benefits that would be achieved by prepositioning equipment at NTC.

(2) Determine the best schedule for and the quantities of equipment to be prepositioned to achieve cost savings.

(3) Review training schedules and/or possible changes in Army policy to minimize costs.

THE BASIC APPROACHES used in this study were to:

(1) Review the current plan for tanks, BFVs, and CS/CSS equipment for FY 88-91.

(2) Identify alternatives to the current plan.

(3) Develop cost estimates for the current plan and the alternatives.

(4) Identify the most economic options for M1A1s, BFVs, and CS/CSS equipment with respect to transporting or prepositioning this equipment.

THE STUDY SPONSOR was the Deputy Chief of Staff for Operations and Plans, who established the objectives and monitored study activities.

THE STUDY EFFORT was directed by Kenneth R. Simmons, Force Systems Directorate.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-FS, 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.

Tear-out copies of this synopsis are at back cover.

CONTENTS

ANNOTATED BRIEFING

APPENDIX

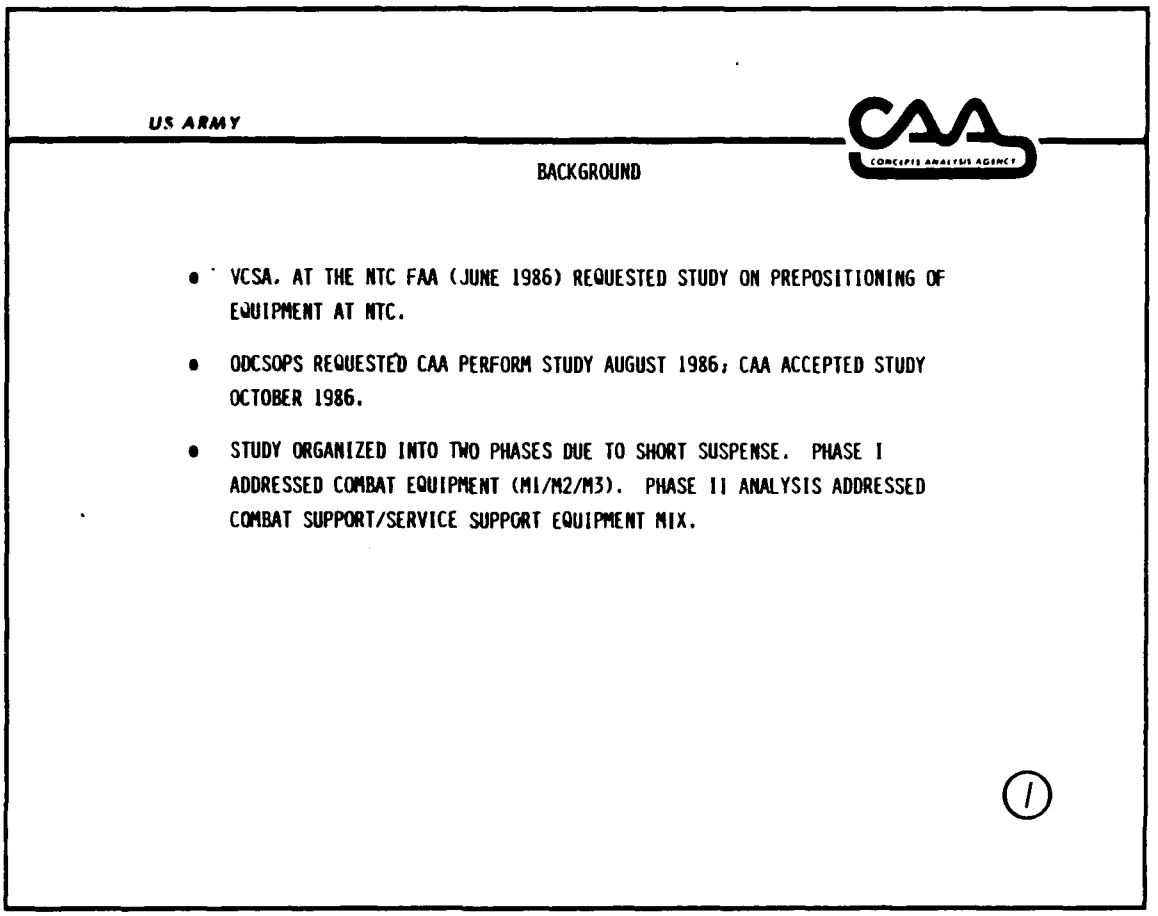
TABLES

NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT (NTCPE) STUDY

BRIEFING

INTRODUCTION

The NTCPE Study was performed for the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) Training Support Division. The deliverables for this study were the final results briefing package and study documentation in the form of an annotated briefing which follows. More detailed documentation is contained in appendices to this report.



The NTCPE Study was conducted by the US Army Concepts Analysis Agency (CAA) to provide the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) Training Support Division (DAMO-TRS) with an analysis of prepositioning equipment at the National Training Center (NTC) versus transporting equipment to the NTC. The Vice Chief of Staff of the Army (VCSA), at the June 1986 Functional Area Analysis (FAA), questioned whether equipment should be transported to the NTC or be prepositioned. CAA organized the study into 2 phases in order to provide a quick response to the VCSA questions and in particular determine whether cost benefits would be realized by prepositioning the M1A1 tank at the NTC (Phase I). This led to the issues discussed in Chart 2.

US ARMY

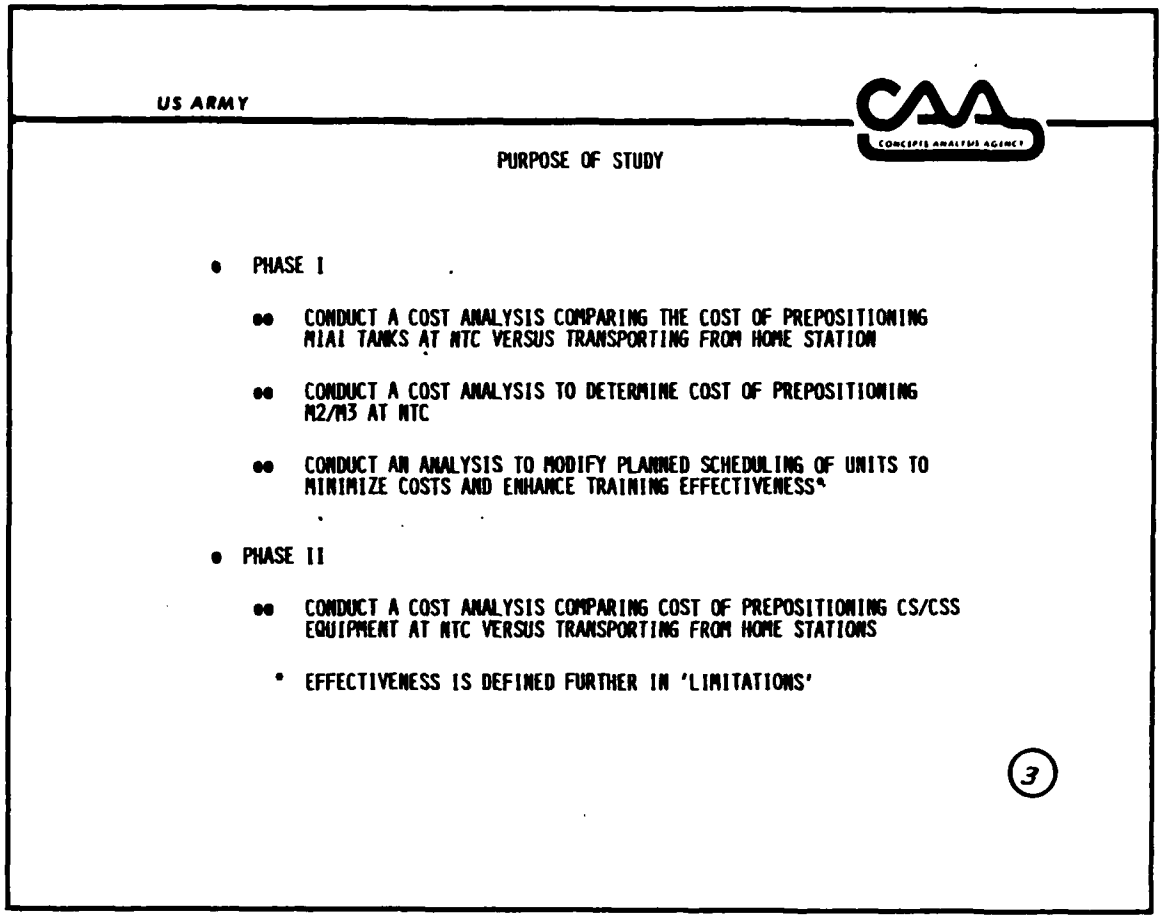
NATIONAL TRAINING CENTER (NTC) EQUIPMENT DISTRIBUTION ISSUES

•	ISSUE 86-5	THE MOST COST EFFECTIVE MIX OF PREPOSITIONED VEHICLES FOR SUPPORT OF TRNG AT NTC HAS NOT BEEN DETERMINED, E.G., BEST MIX FOR NEAR TERM, TIMING FOR M2/M3 AND OTHER FORCE MOD EQUIP, CORPS/DIV CSS ELEMENTS, HEAVY EQUIP TRANSPTRS.	
••	ACTION	ACCOMPLISH COMPREHENSIVE COST-BENEFIT ANALYSIS NOT LATER THAN 31 DEC 86.	TRADOC
•	ISSUE 86-6	CONSIDERING THE MISSION OF THE NTC AND THE COST OF 120MM TANK AMMUNITION, SHOULD THE M1A1 BE PREPOSITIONED AT FORT IRWIN?	
••	ACTION	DETERMINE THE RELATIVE DESIRABILITY OF PREPOSITIONING THE M1A1 IN NTC FLEET VERSUS OTHER ALTERNATIVES, NLT 31 DEC 86.	TRADOC

REF: ODCSOPS

(2)

The issues listed in Chart 2 were raised at the June 1986 FAA. Although TRADOC was designated as the action agency, CAA was asked to perform the study because of the quick response requirement. The study was separated into two phases by CAA in order to address issue 2 (86-6) before the December 1986 deadline.



The purpose of the study is listed in Chart 3.

PHASE I. A cost analysis was conducted to compare the cost of prepositioning M1A1 tanks at the NTC versus the cost of transporting M1A1s. Included in the analysis was the cost of firing 120mm ammo for the M1A1s as planned versus 105mm for the M1s. Note only those units with M1A1s in POMCUS (prepositioning of materiel configured to unit sets) would fire the 120mm ammo. In addition, Phase I addressed the peripheral issue of advancing the FY 91 scheduled delivery of the Bradley Fighting Vehicles (BFVs) to reduce rail transportation costs and to make BFVs available at the NTC to units that might have BFVs in POMCUS but not yet have BFVs at home station.

PHASE II. A cost analysis was conducted to compare the cost of transporting combat support/combat service support equipment (CS/CSS) to the NTC by rail versus the alternative of prepositioning a mix of CS/CSS equipment at the NTC.

US ARMY

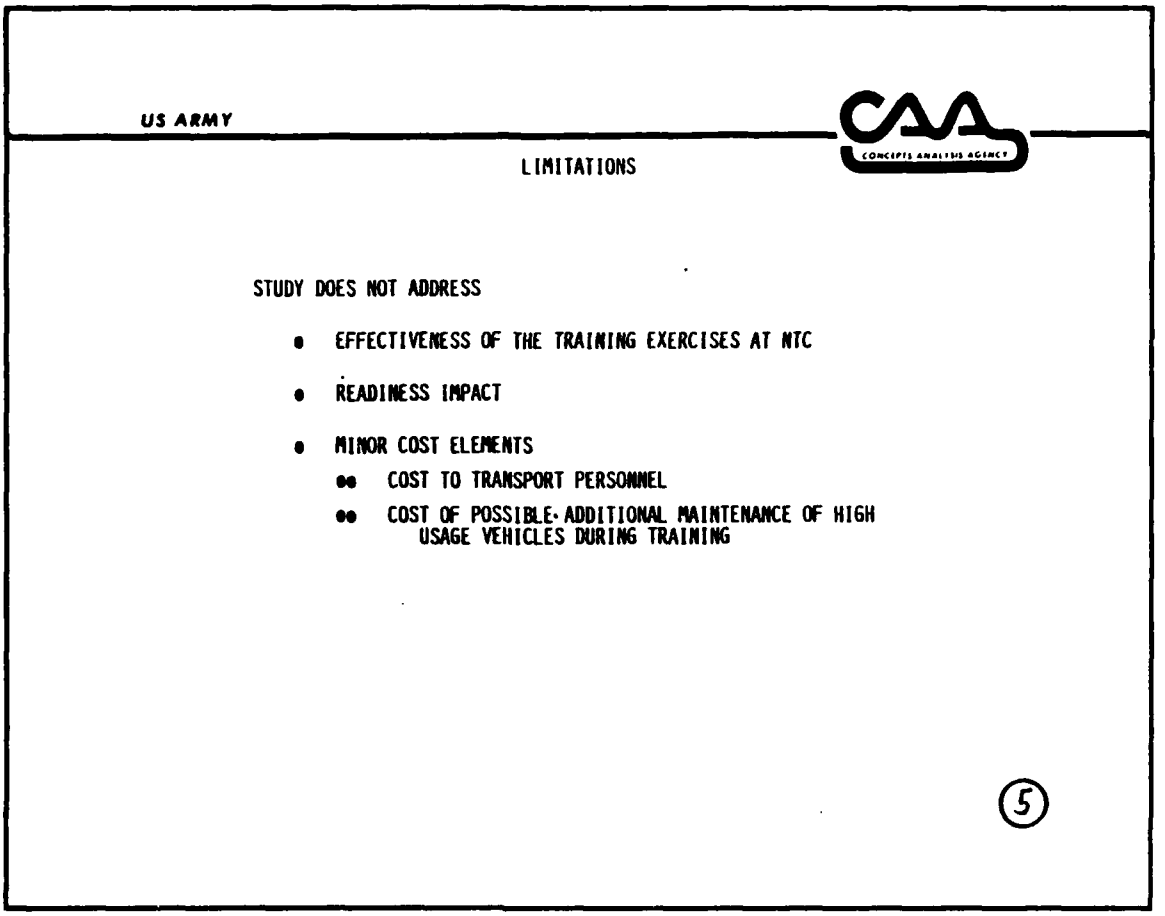
ASSUMPTIONS

- OPERATIONS AND SUPPORT COSTS FOR ALL EQUIPMENT USED AT NTC DURING TRAINING EXERCISES WILL NOT IMPACT ON ANALYSIS.
- THE RATE OF AMMUNITION USAGE PER BATTALION AND AMMUNITION COSTS PER ROUND WILL NOT CHANGE DURING COURSE OF STUDY.
- FORSCOM, ARNG, AND USAREUR POMCUS MODERNIZATION PLANS WILL BE EXECUTED AS CURRENTLY PLANNED.
- SINGLE DECK RAILCARS, 90 FEET IN LENGTH, WILL BE USED TO TRANSPORT EQUIPMENT TO NTC.

④

The assumptions of the study are shown in Chart 4. Operations and support (O&S) costs for equipment used at the NTC during training exercises were assumed to not impact on the analysis since O&S costs would be incurred whether equipment was prepositioned or transported. Ammunition usage at the NTC and FORSCOM, ARNG, and USAREUR modernization plans were assumed to remain unchanged.

Railcars were costed assuming usage of single layer railcars, 90 feet in length. The railroad company may substitute two smaller railcars for a larger car with no increase in price. Also a few bi-level and tri-level railcars may be utilized, but these do not impact on the average cost.



The limitations of the study are shown in Chart 5. The study does not address the effectiveness of the training exercises at the NTC. The study does categorize the suitability of training, as defined by CAA and ODCSOPS (DAMO-TRS). Suitability is based on the type of equipment used at the NTC compared to the type of equipment used at home station and in POMCUS. The impact on readiness of a force unit was not addressed in the study. Also, some minor cost elements that were not considered significant were not included in cost estimates.

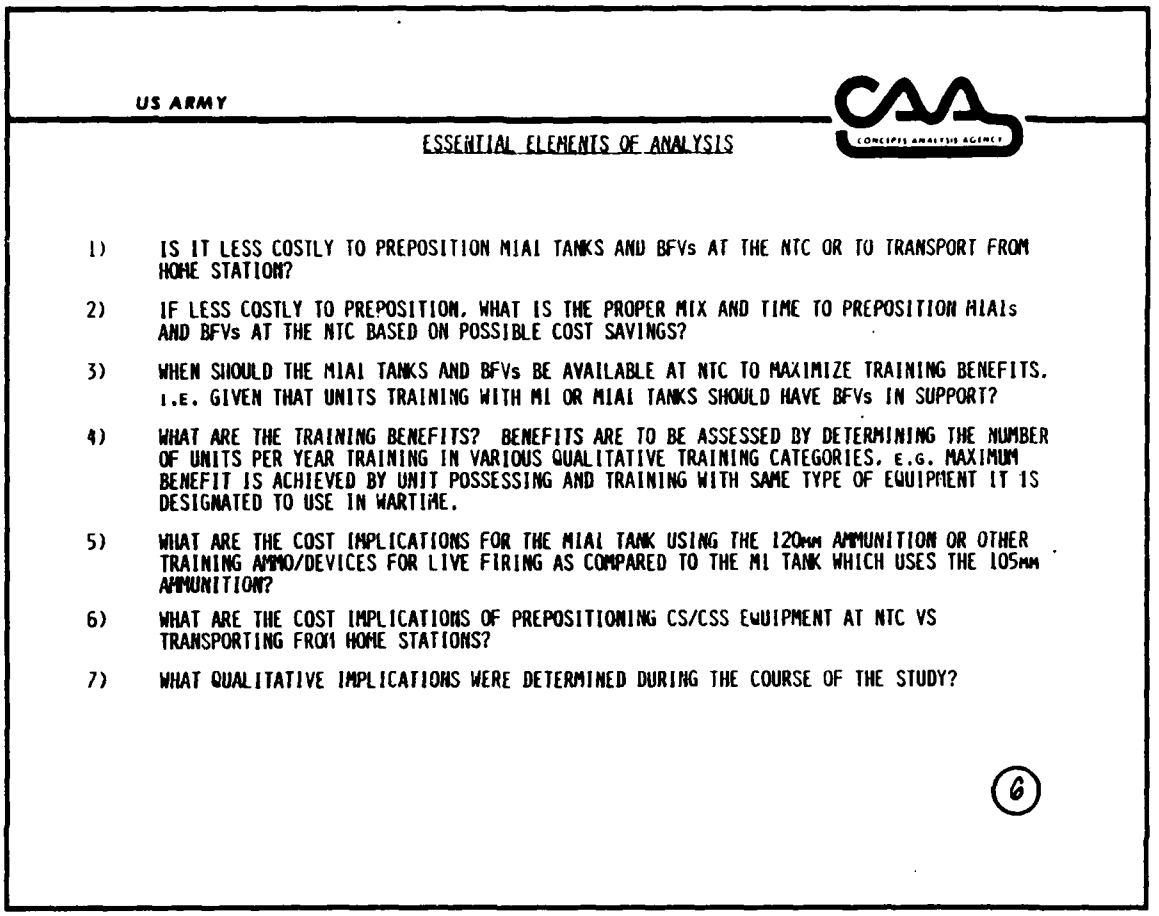
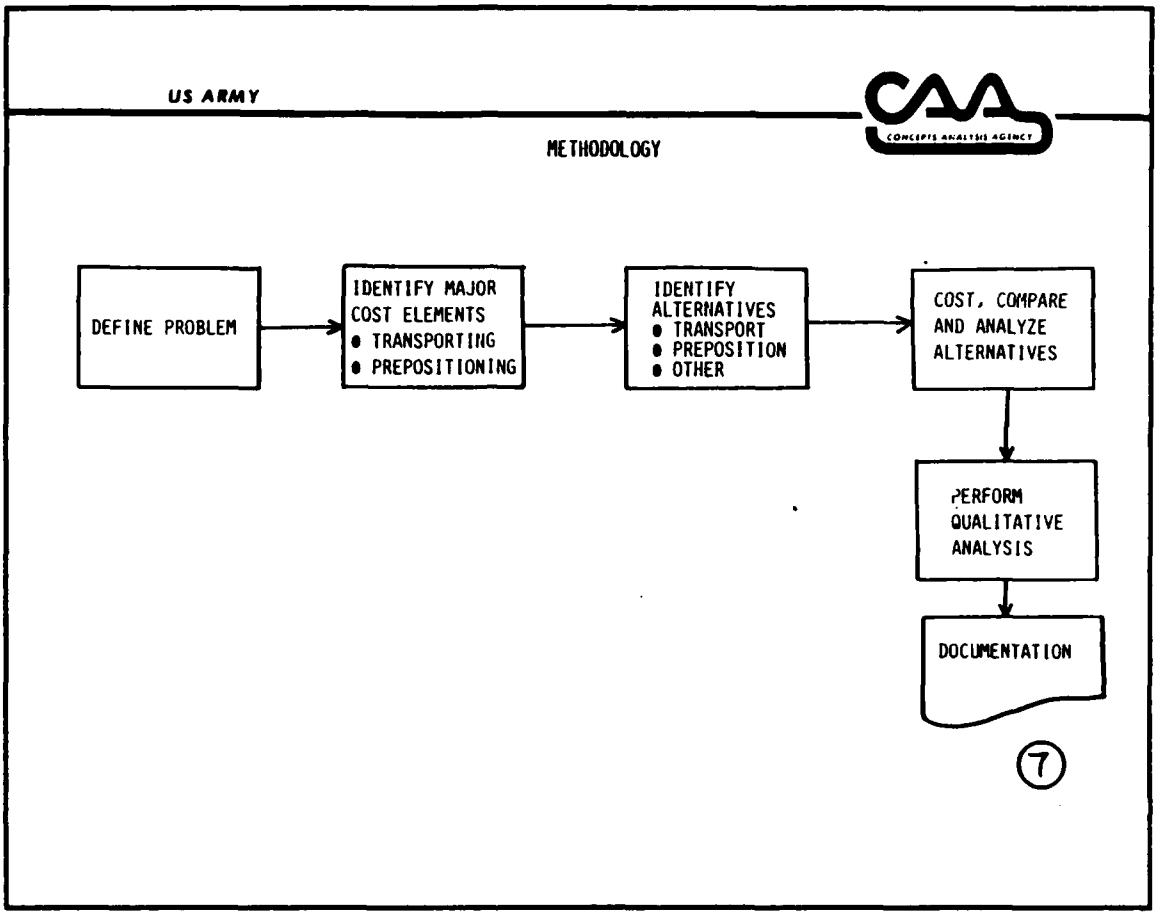
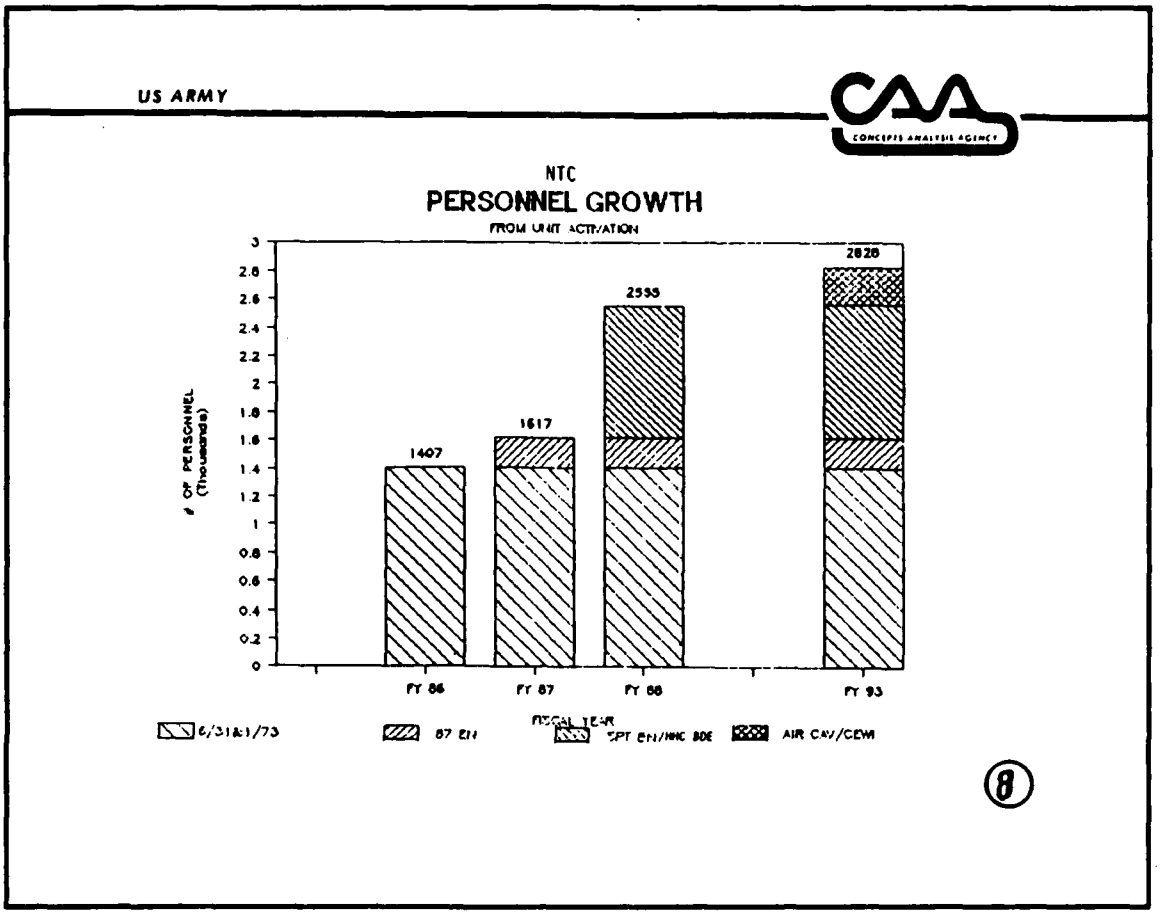


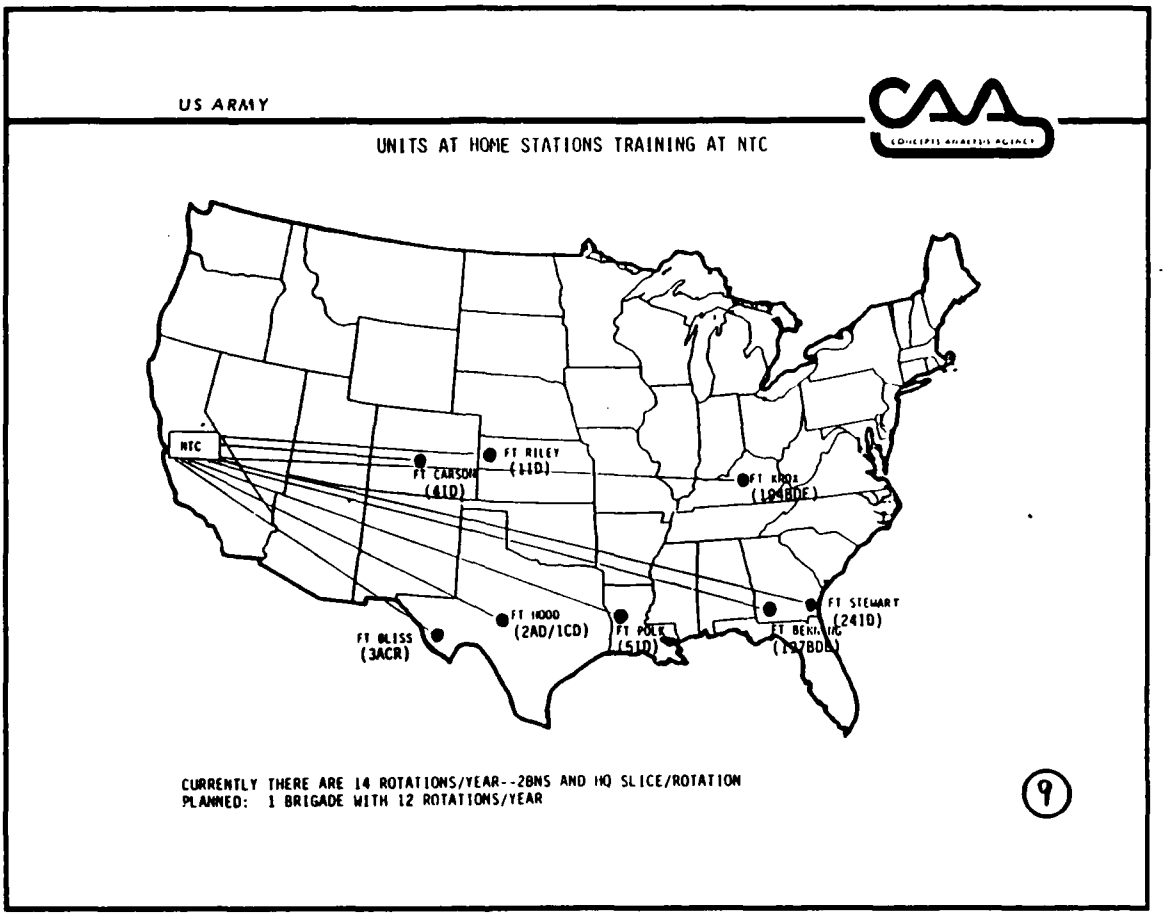
Chart 6 lists the essential elements of analysis (EEA). EEA 1, 2, 3, and 5 apply to Phase I of the study only and EEA 6 is addressed in the second phase only. EEAs 4 and 7 concern both phases of the study.



The study methodology is shown in Chart 7. The problem was defined as whether to transport or preposition M1A1s, BFVs, and CS/CSS equipment. Cost elements for prepositioning and transporting were identified and estimated. Alternatives to the current plans (preposition M1A1s in FY 89 and 90, preposition BFVs in FY 91, and transport CS/CSS equipment FY 88-91) were formulated. A cost comparison and analysis of the current plan versus alternatives was conducted. Qualitative issues identified during the course of the study were incorporated in the analysis. The study report serves as documentation of the analysis.



NTC operations are described in detail in Appendix D. As Chart 8 illustrates, operations at the NTC will result in an increase in the number of military personnel stationed at NTC from FY 86-87 and is projected here to FY 93. Rotational units are excluded. The 6/31 Armored Battalion and the 1/73 Armored Battalion are currently stationed at NTC. The 87th Engineer Company, Separate Brigade was activated 1 March 1987. The headquarters and headquarters company (HHC) and support battalion activations are scheduled in FY 88 with the air cavalry troop and the Communications Electronics Warfare Intelligence (CEWI) company scheduled in FY 93. The unit military strength will have doubled between FY 86 and FY 93 with additional gains projected beyond FY 93. Charts 9 through 12 provide background and historical cost breakdown for training at the NTC.



Not all force units located in CONUS are POMCUS type units. The POMCUS units that rotate to the NTC and their approximate locations are shown in Chart 9. Currently there are 14 rotations per year. Each rotation consists of an armor and a mechanized battalion and a brigade-headquarters slice. Planning is underway to train with one full brigade and 12 rotations per year in the future.

US ARMY

CAA CONCEPTS ANALYSIS AGENCY

POMCUS BATTALIONS *

HOME STATION	DIVISION	NO. POMCUS BATTALIONS
FT HOOD	1ST CAV DIV	4
FT HOOD	2D ARM DIV	4
FT POLK	5 ID	3
FT RILEY	1 ID	4
FT CARSON	4 ID	5
FT KNOX	194TH ARM BDE	2
FT BENNING	197TH INF BDE	1
TOTAL		23

* BATTALIONS THAT HAVE OR WILL HAVE MIAIs IN POMCUS

(10)

Chart 10 lists the divisions that have battalions which currently have equipment in POMCUS or are scheduled to receive equipment in POMCUS. The number of POMCUS battalions for each home station is also shown.

US ARMY

BASE CASE EXAMPLE
FT HOOD ROTATION EXPENSES
(000)

	1st BDE 26 NOV-17 DEC 84	2d BDE 21 JAN-9 AUG 85	1st BDE 27 JAN-15 FEB 86	2d BDE 7-26 MAY 86	PCT OF TOTAL 86 COSTS
TDY	$995.1	$1,087.9	$1,034.1	$1,080.1	16
PERS	3,204	3,500	3,200	3,500	
TRANS COST	$1,963.5	$2,396.7	$3,097.2	$2,845.2	44
RAILCARS	351	410	439	410	
SERVICES	$995.4	$1,067.3	$1,076.2	$ 999.7	15
(R.O. AT NTC)	($684.7)	($ 854.8)	($ 815.7)	($ 914.3)	
(SAAM FLIGHTS)	($310.7)	($ 212.5)	($ 260.5)	($ 85.4)	
SUPPLIES & EQUIP	$107.5	$7.5	$70.9	$5.8	
CLASS 9	$439.7	$1,527.1	$1,655.6	$1,552.5	24
TOTAL	$4,501	$6,087	$6,934	$6,483	

(11)

The example in Chart 11 shows the costs incurred for four rotations to the NTC from Ft Hood, Texas. Rail transportation comprised the bulk of all expenses, amounting to 44 percent of total costs in the 1986 rotations.

US ARMY

HISTORICAL COST OF ROTATIONS AT NTC

FY	NO. ROTATIONS	COST $(000)	NORMALIZED * COST $(000)	COST ** $FY 87 (000)	CHANGE
83	8	$ 6614	$11575	$17524	(START UP)
84	12	$ 9611	$11213	$12480	BASE
85	14	$11119	$11119	$11945	- 4.0%
86	13	$11414	$12292	$12796	+ 2.5%

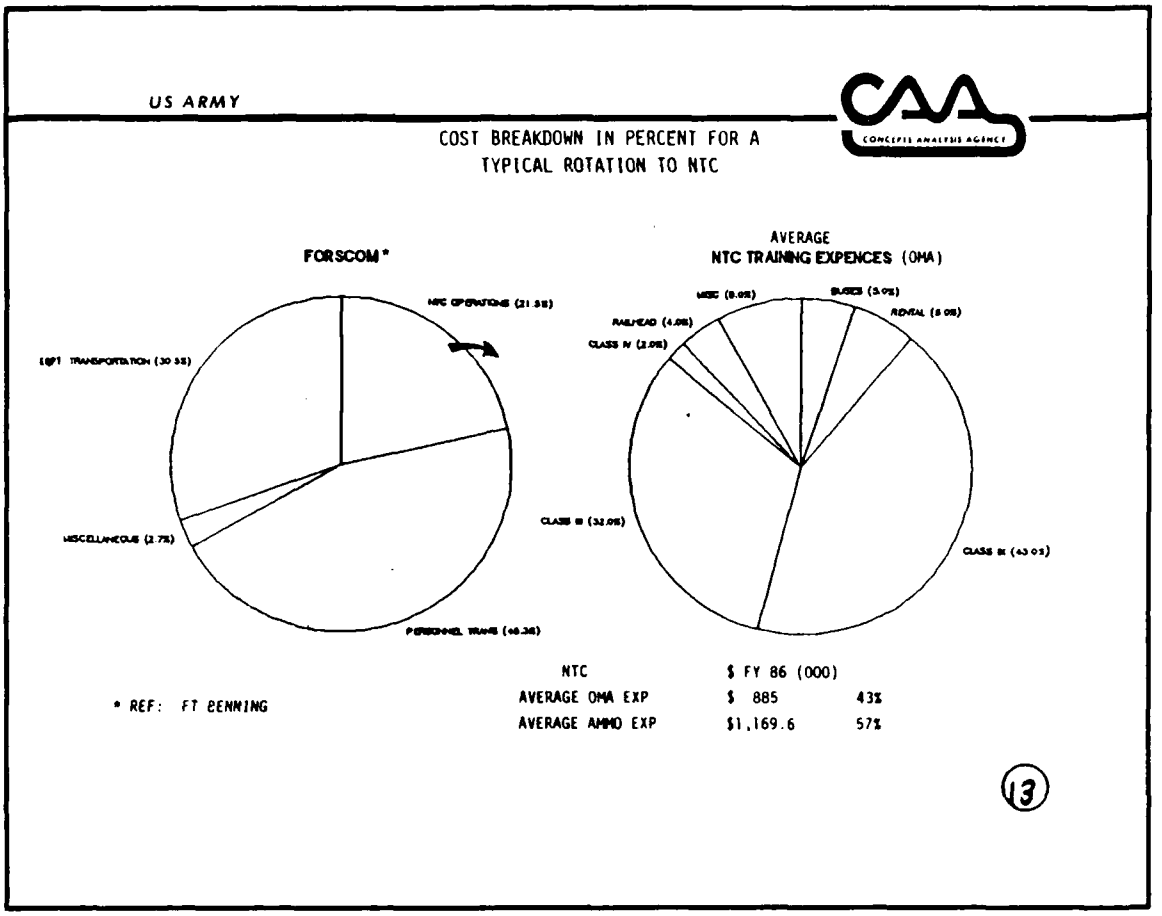
* COST NORMALIZED FOR 14 ROTATIONS

** COSTS INFLATED BASED ON OMA INFLATION INDICES

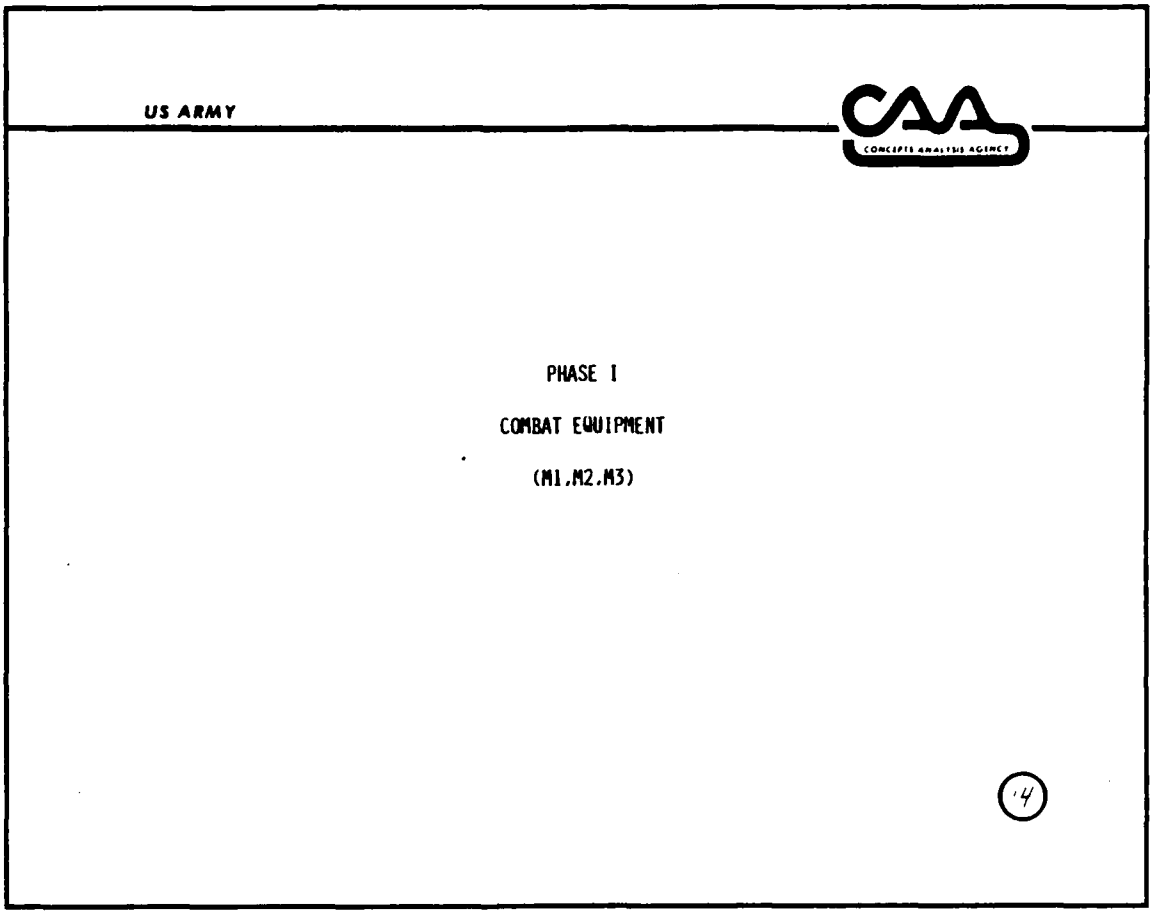
(12)

The historical cost of conducting operations at NTC is shown in Chart 12 for the years FY 83 (start-up year) to FY 86. Normalizing the cost for 14 rotations and comparing with the base year 1984, the change in costs range from a minus 4 percent to a plus 2.5 percent which is not a significant change in operational costs.

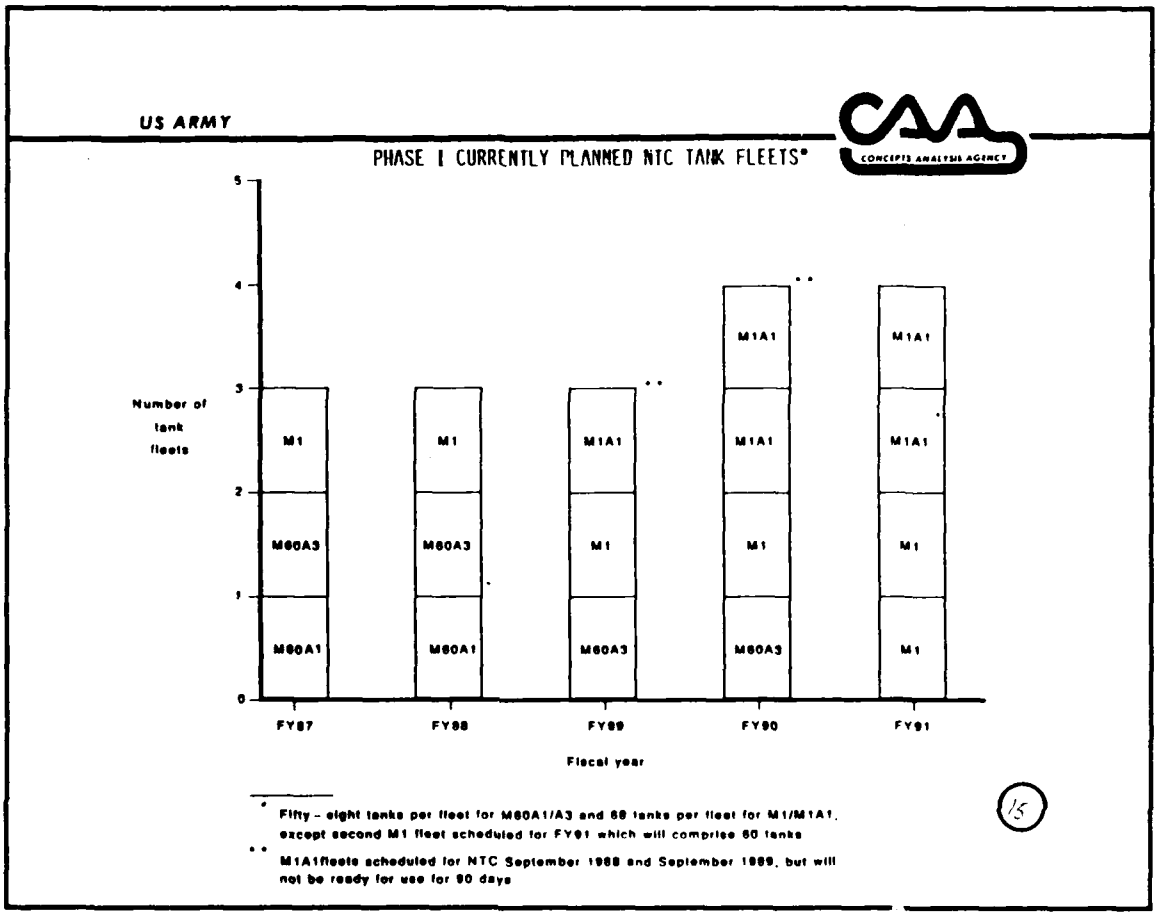
NOTE: Inflation indices from Department of the Army Office of the Comptroller of the Army, Program Budget Committee (DACA-PBC) Memo No. 86-131, dated 20 Feb 86.



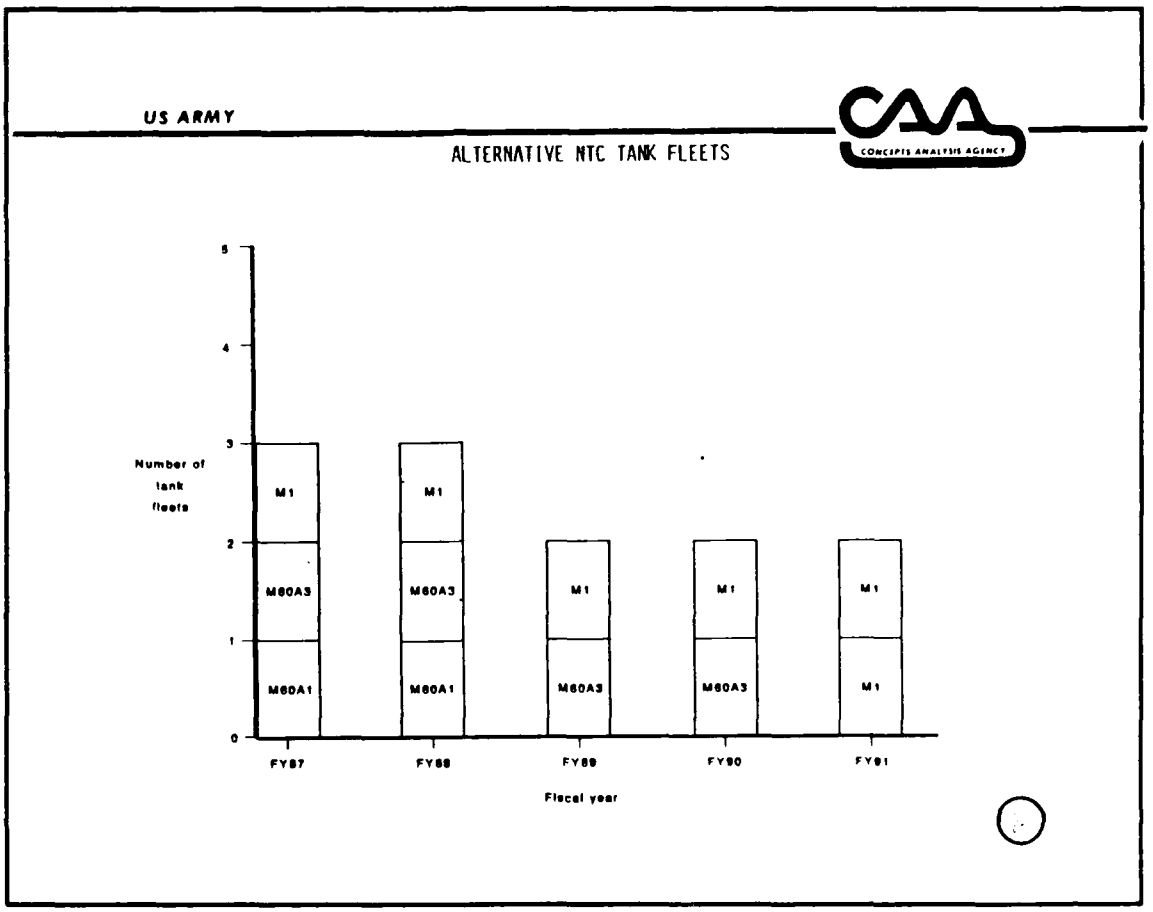
The cost for a FORSCOM unit to train at NTC ranges from 20 to 35 percent of that unit's annual training budget. Transportation is the largest expense. The figure on the left (Chart 13) shows expenditures for a rotation to NTC from Ft Benning, Georgia. The OMA cost-breakdown averaged over all rotations is displayed in the righthand figure. Ammo accounts for 57 percent of average total cost of NTC training expenses with Class III and Class IX accounting for the majority of the training costs expended in the OMA category.



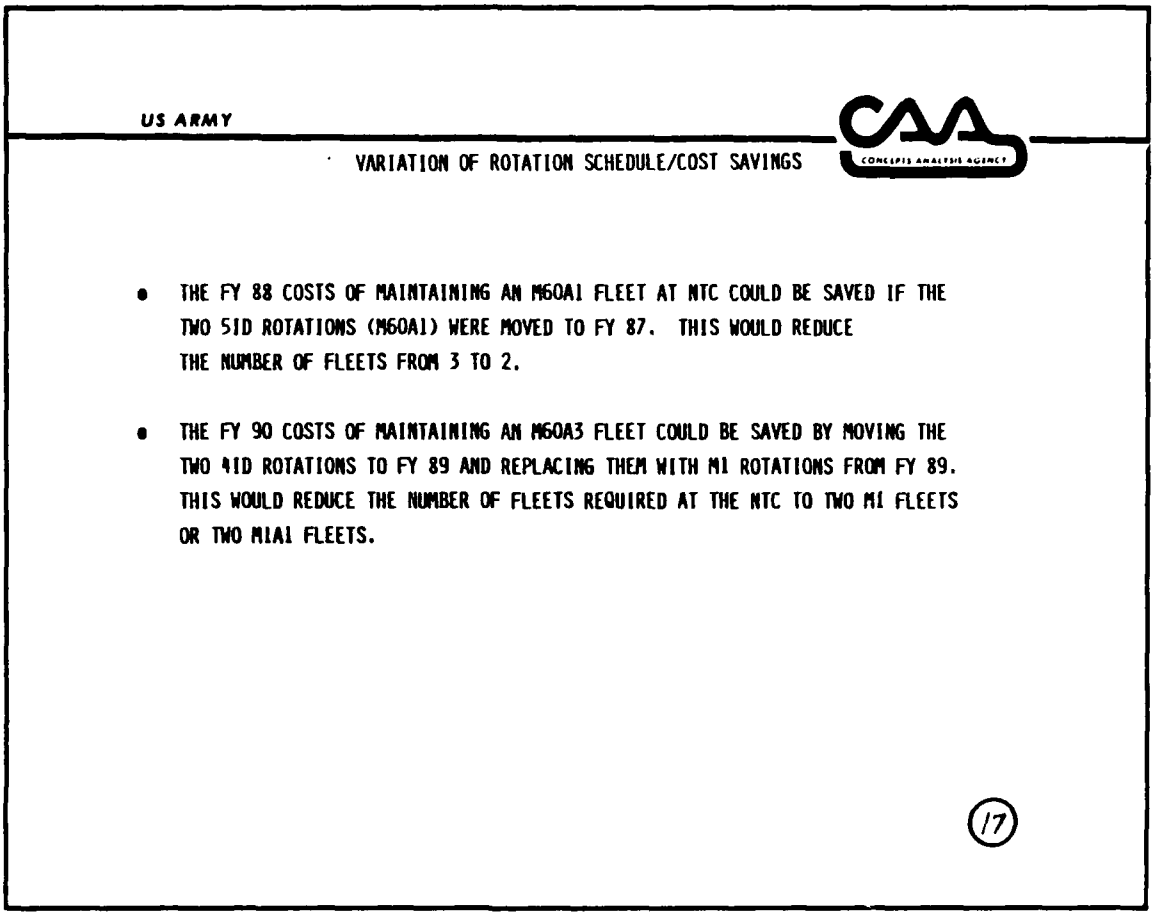
Phase I addresses tanks and BFVs.



Tank fleets scheduled for the NTC are shown in Chart 15. Currently, there is one fleet each of M1s, M60A3s, and M60A1s. The M60A1 fleet will be phased out in FY 89 to coincide with the arrival of the first fleet of M1A1s. The second fleet of M1A1s is scheduled to arrive in FY 90. The M60A3 fleet will be replaced with a second fleet of M1s in FY 91 (the number of tanks per fleet stated in footnote 1 (*) included floats).



Tank fleets that would be prepositioned at NTC if M1A1s are not prepositioned as currently planned are shown in Chart 16. Under this alternative, there would be only two tank fleets by FY 91 compared to four under the current plan (Chart 15).



Advancing the rotations of the 5ID and 4ID would allow for the respective removal of the M60A1 and M60A3 tank fleets 1 year earlier than scheduled. This would produce cost savings of $1.2 million since there would be fewer tank fleets that would require contractor maintenance in the respective years, FY 88 and FY 90.

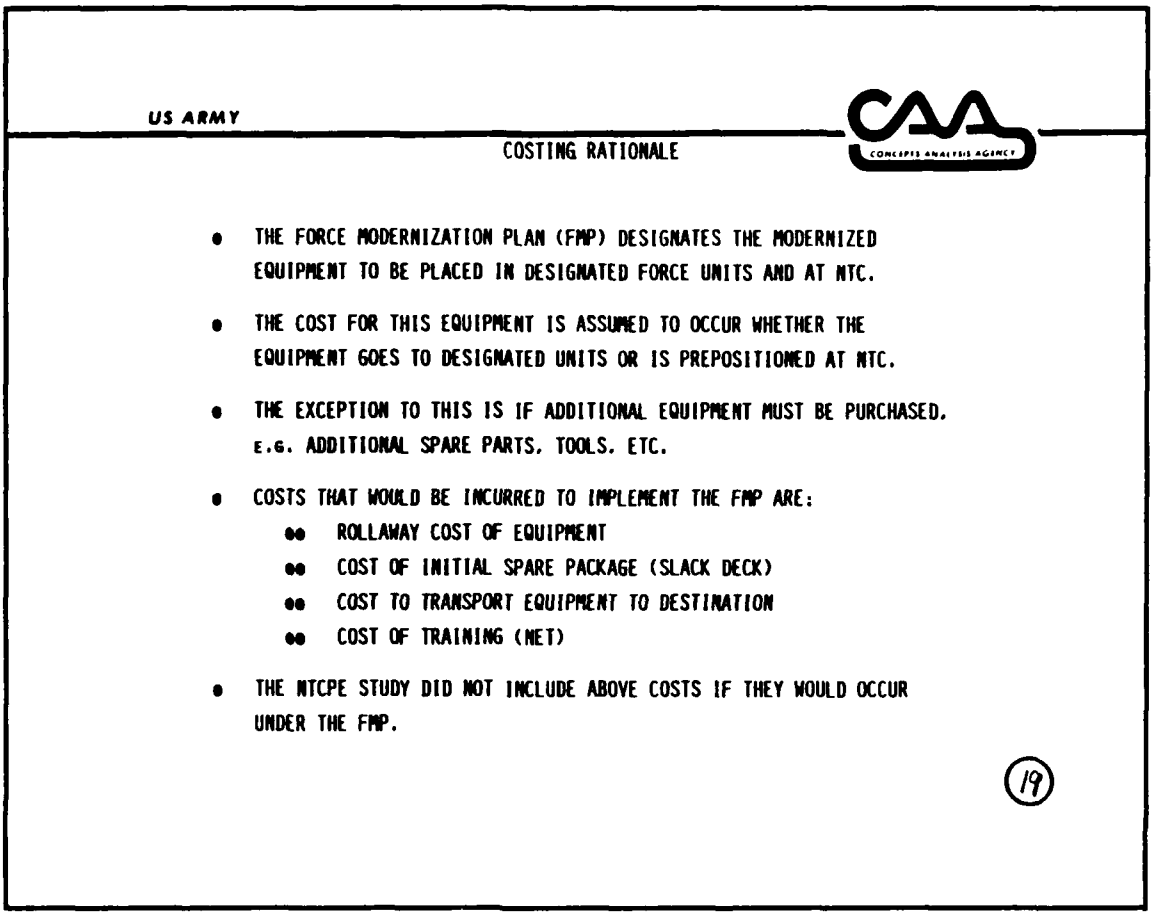
US ARMY

COST ELEMENTS

- TRANSPORTING. COST TO:
  - LOAD & TRANSPORT EQUIPMENT (RAIL)
  - OFFLOAD AND TRANSPORT BY TRUCK
  - LOAD AND TRANSPORT EQUIPMENT BACK TO HOME STATION
  - SERVICE RETURNED EQUIPMENT (A 'WASH')
- PREPOSITIONING. ADDITIONAL COST OF:
  - CONTRACTOR SUPPORT
  - BASE OPS (INCREASE)
  - FACILITIES (MCA)
  - TOOL SETS AND VEHICLE TEST EQUIPMENT
  - SPARE PARTS
- FIRE AMMO (TRADEOFF 105 VS 120mm TANK OR AMMO DEVICE)

(18)

Major cost elements considered in the cost analysis are shown in Chart 18. Transport costs include rail costs, transportation costs to/from the railhead to the NTC by commercial trucks, and load/unload costs from railcars. Costs to service equipment was considered a "wash" since equipment would have to be maintained whether it was operating at NTC or home station. Prepositioning costs include costs for: contracting, vehicle, communication and electronic equipment maintenance, expansion of NTC facilities with associated base operation increases, additional tool sets and test equipment, and additional spare parts. Also included is the tradeoff between 105mm and 120mm tank ammo.



The costing rationale is depicted in Chart 19. Assets to be prepositioned at NTC may be obtained from several sources. These are:

- War reserves.
- Redistributed assets from current force units.
- POMCUS.
- Assets in the Force Modernization Plan.

Therefore, neither costs to procure equipment nor transportation costs to first destination point are included unless additional equipment is required and must be procured. Normal cost of NTC operations and costs for training force units at NTC are not included. Only the additional costs due to adding alternatives are included.

US ARMY

COST OF PREPOSITIONING CURRENT FLEET OF M1 TANKS AT NTC IN 1986

COST ELEMENT	COST $FY 86 (000)
• PROCUREMENT	NA *
• TRANSPORTATION FROM DEPOT TO NTC	NA *
• TRANSPORTATION OF CONTRACTOR AND OTHER PERSONNEL FOR M1 MAINTENANCE TRAINING	55.2
• CONSTRUCTION, OMA-SECURITY FENCING FOR M1 AND TO STORE ADDITIONAL SPARE PARTS	282.8
• ADDITIONAL INITIAL SUPPLIES, TOOLS, SPARE PARTS AND POL	2108.5
• ADDITIONAL MILES EQT	NA**
TOTAL	$ 2446.5

* COSTS INCLUDED IN FORCE MODERNIZATION PLAN
** COSTS INCLUDED IN M1 MILES MODERNIZATION PLAN

(20)

A fleet of M1 tanks was prepositioned at NTC in 1986. The cost to preposition this additional fleet was obtained from NTC and was used by the contractor as the basis for estimating costs for additional fleets of tanks.

US ARMY

TYPICAL COST AND QTY OF RAIL CARS USED TO TRANSPORT EQUIPMENT TO NTC

HOME STATION	AVG COST FOR FY86 ROTATION $FY 86 (000)	# RAILCARS*	AVG ONE WAY COST PER RAILCAR IN $ FY 86**	AVG ONE WAY RAILCAR COST IN $ FY 87***
FT HOOD	$1524	400	$3810	$3966
FT KNOX	$1142	400	$2855	$2972
FT STEWART	$1064	280	$3800	$3956
FT CARSON	$ 351	360	$ 974	$1015
FT BENNING	$ 476	167	$2850	$2967
FT RILEY	$1227	301	$4077	$4244
FT POLK	$ 753	225	$3348	$4607
FT BLISS	NOTE 4	NOTE 4	NOTE 4	$3000 (EST)

* UNITS USE SOME PREPOSITIONED EQUIPMENT AT NTC, FT IRWIN
** LOWER COSTS OF SOME HOME STATIONS DUE TO COMPETITION OF MULTIPLE RAILROADS GOING TO FT IRWIN
*** COSTS INFLATED BASED ON OMA INFLATION INDICES
**** DATA NOT AVAILABLE

(21)

Chart 21 shows the input data used to compute the average cost per railcar. The average FY 86 rotation costs and number of railcars transported, shown in columns 3 and 4, respectively, were obtained from force units. Average one-way cost per railcar was computed and inflated to FY 87 dollars. The primary factors affecting cost per railcar were distance from NTC and the degree of competition among railroads. Where competition was low, costs were higher.

US ARMY

CAA (CONCEPTS ANALYSIS AGENCY)

M1A1 ALTERNATIVES

- PREPOSITION M1A1s AT NTC (RETAIN M1s AT NTC)
  - BASE CASE - PREPOSITION M1A1s AT NTC AS CURRENTLY PLANNED.
  - ALTERNATIVE 1 - PREPOSITION M1A1s AT NTC AND SUBSTITUTE 35MM AMSTO TRAINING DEVICE FOR M1A1 120MM AMMO.
  - ALTERNATIVE 2 - PREPOSITION M1A1s AT NTC AND PROVIDE M1A1 TRAINING AIDS FOR EACH POMCUS BATTALION AT HOME STATION
  - ALTERNATIVE 3 - PREPOSITION M1A1s AT NTC PLUS POSITION M1A1 TRAINING AIDS AND 1 M1A1 PER POMCUS BATTALION AT EACH HOME STATION FOR CREW AND TURRET MAINTENANCE TRAINING.
- TRANSPORT M1A1s TO NTC (RETAIN M1s AT NTC)
  - ALTERNATIVE 4 - DO NOT PREPOSITION M1A1s AT NTC. 3ACR TO TRANSPORT THEIR M1A1s. (ONLY 3ACR TRAINS ON M1A1s)

NOTE: 3ACR ONLY CONUS FORCE UNIT TO HAVE M1A1s.

(22)

Chart 22 shows the alternatives separated into the two main courses of action: preposition M1A1s at the NTC, or transport them.

US ARMY

COST ESTIMATE TO FIELD M1A1 FLEET AT NTC
(NON-RECURRING COSTS) $ FY 87 (000)

PROCUREMENT COST OF TANKS	0*
CONSTRUCTION SECURITY FENCING	$ 291
ADDITIONAL SUPPLIES, SPARE PARTS, TOOLS	$1041**
TRANSPORT OF CONTRACTOR AND OTHER PERSONNEL FOR M1A1 MAINTENANCE TRAINING	$ 57
TOTAL	$1389

* COST OF TANKS AND TRANSPORTATION INCLUDED IN FORCE MODERNIZATION PLAN

** ASSUME 49% OF COST OF ADDITIONAL M1 SPARE PACKAGE

(23)

Chart 23 shows the nonrecurring costs to preposition the M1A1 fleet at NTC. These costs were derived from the actual costs incurred to preposition an M1 fleet at NTC in 1986 (see Chart 20). The security fencing and personnel transport costs were directly taken from the 1986 M1 prepositioning costs. Because many of the M1A1 and M1 spare parts are the same, the additional supplies, spare parts, and tools for the M1A1s were estimated to be 49 percent of the costs incurred for these when the M1s were prepositioned in 1986.

US ARMY

CAA CONCEPTS ANALYSIS AGENCY

M1A1 BASE CASE
COST TO PREPOSITION M1A1 TANK FLEETS AT NTC*
$ FY 87 (000)

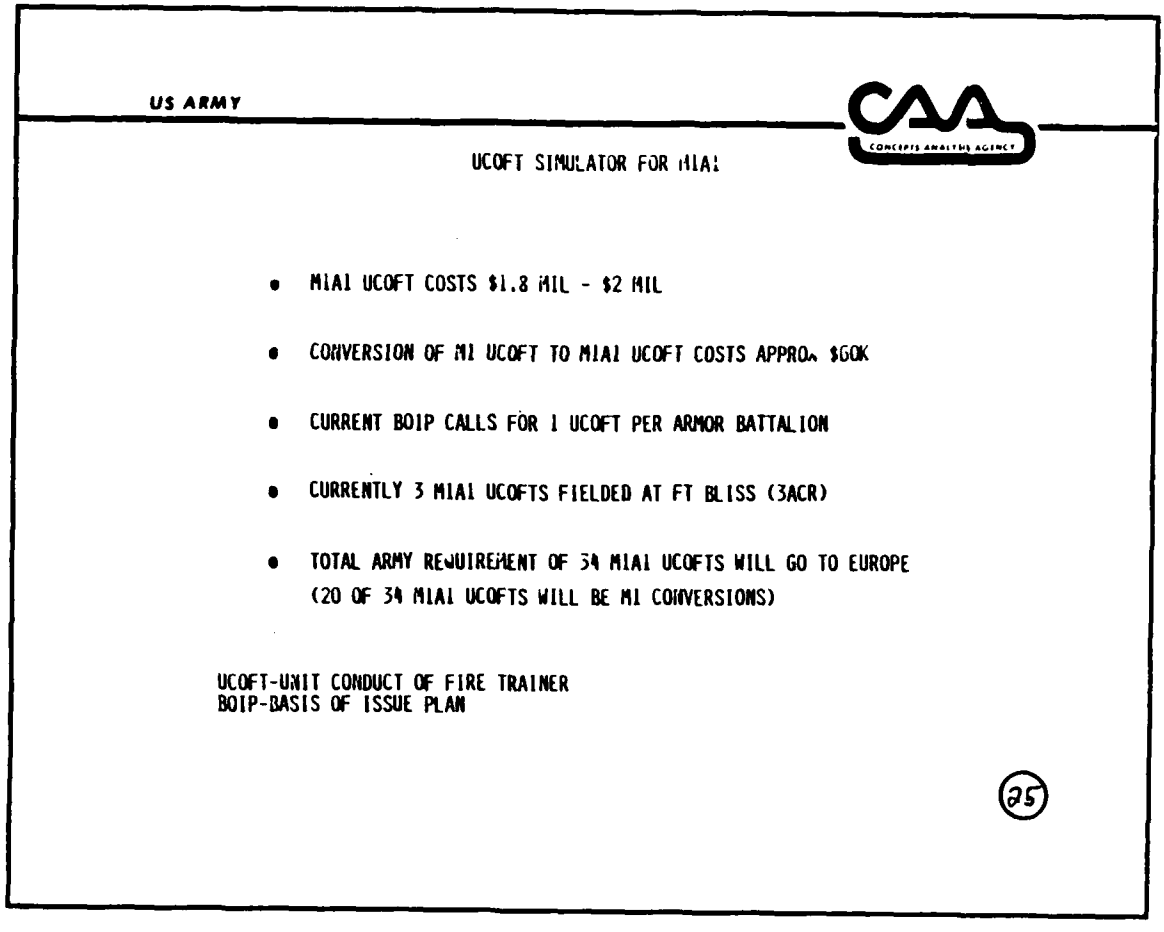
• NONRECURRING COST:	
SUPPLIES, SPARE PARTS, TOOLS, ETC.	$ 1,389
ADDITIONAL SECURITY FENCING (2D FLEET)	$ 280
TOTAL	$ 1,669
• RECURRING COST:	
CONTRACT COST (FY 89 THRU FY 91)	$ 2,231
TRANSPORT COSTS FOR 3ACR IN FY 88	$ 178
COST OF 120MM TANK ROUNDS (FY 88-91)**	$38,292
TOTAL BASE CASE COST (FY 88-91)	$42,370

* EXCLUDES POTENTIAL M1A1 CONVERSION COST OF $60,000 FOR UNIT CONDUCT OF FIRE TRAINER (UCOFT) AT HOME STATIONS

** INCLUDES AMMO FOR ONLY THOSE ROTATIONAL UNITS DESIGNATED FOR POMCUS IN FY 89 THRU FY 91 AND 3ACR IN FY 88-91

(24)

Chart 24 shows the base case nonrecurring and annual recurring costs to preposition two fleets of M1A1 tanks at NTC in FY 89 and FY 90. Appendix E, paragraph E-2, discusses the computations that were used to estimate the ammunition costs for the base case. Contract costs and transport costs for the 3ACR are explained in Appendix E (para E-3 and E-6, respectively). Note that the potential cost for the M1A1 UCOFT has been excluded. Chart 25 discusses the UCOFT in more detail.



The Unit Conduct of Fire Trainer (UCOFT) has been developed for the M1 tanks. A conversion kit for the M1A1 costs approximately $60,000. Currently, there are no plans to buy additional UCOFTs for use on M1A1s in CONUS. This simulator and other training aids should be made available to force units with M1s, if they expect to train on M1A1s at NTC and have M1A1s in POMCUS.

US ARMY

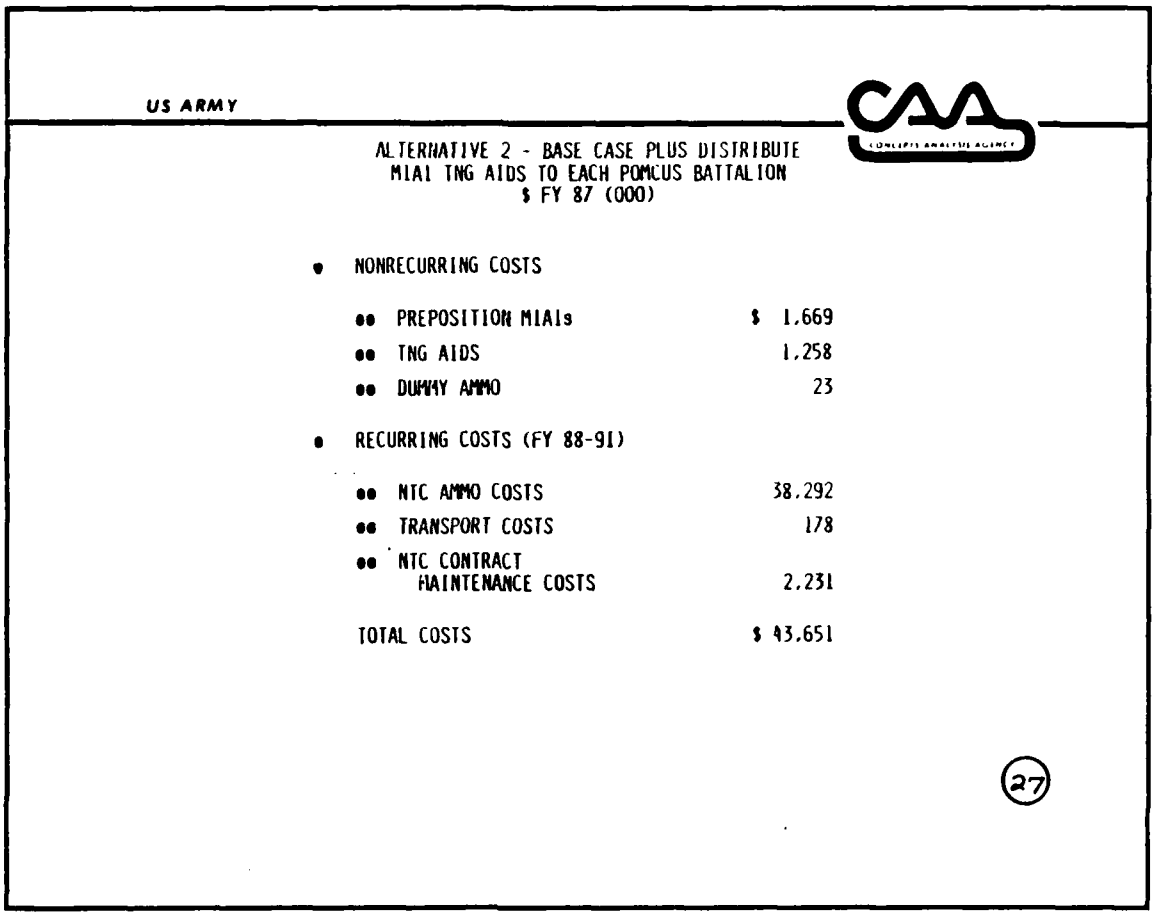
ALTERNATIVE 1
SUBSTITUTE 35MM AMMO TRAINING DEVICE IN BASE CASE
$ FY 87 (000)

• BASE CASE COST WITH 120MM TANK ROUNDS (FY 88-91)		$42,370
• BASE CASE COST WITHOUT 120MM AMMO FY 88-91	$ 3,900	
• 35MM AMMO TRAINING DEVICE*		
COST OF DEVICES	$ 5,800	
COST OF 35MM AMMO (FY 89-91)	$ 3,651	
• TRANSPORT COSTS FOR 3ACR (FY 88 ONLY)	$ 178	
SUB TOTAL	$ 9,629	
BASE CASE WITH AMMO DEVICE		$13,529
• COST SAVINGS BY USING DEVICE (FY 89-91)		$28,841

* COST TO MAINTAIN DEVICE NOT AVAILABLE

(26)

Chart 26 shows the costs of the base case with a 35mm ammo device attached to each M1A1 tank. Since ammo costs comprise most of the base case cost, substantial savings are realized in this alternative. Appendix E, paragraph E-5, provides an explanation of calculations for costs of 35mm ammo.



The costs for Alternative 2, where M1A1 training aids are distributed to each POMCUS battalion are shown in Chart 27. The training aids package consists of interactive video discs, video tapes, a breechblock, and an NBC system. These aids are for the purpose of sustainment training and would not substitute for the new equipment training (NET) that would be required before units fall in on M1A1s at the NTC. The NBC system and the breechblock provide sustainment training for mechanics. The training aids and dummy ammo package and their associated costs shown in Appendix E, paragraph E-9, were extracted from the M1A1 POMCUS Study* conducted by the US Army Armor School.

*M1A1 POMCUS Sustainment Study, US Army Armor School, 30 September 1986.

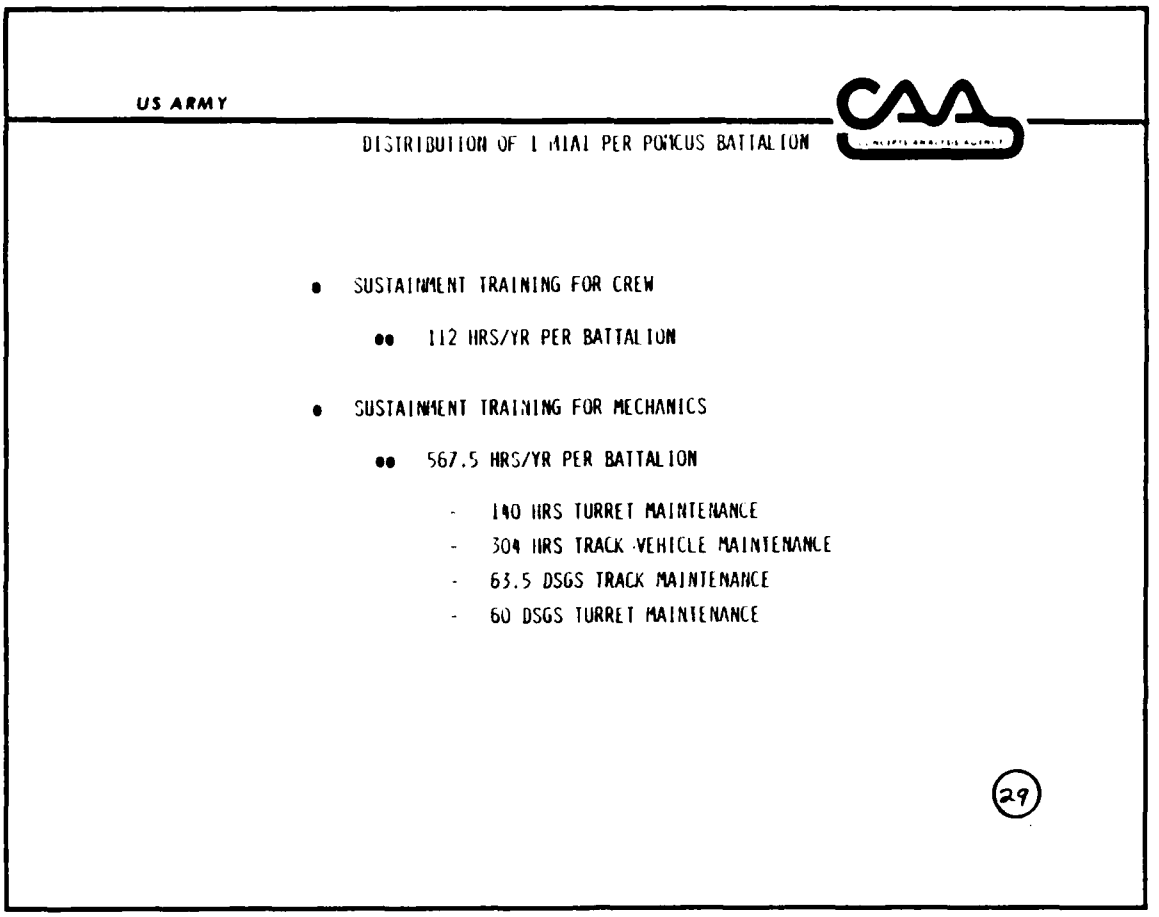
US ARMY

ALTERNATIVE 3 - BASE CASE PLUS DISTRIBUTE M1A1 TNG AIDS AND 1 M1A1 PER POMCUS BATTALION
$ FY 87 (000)

• NONRECURRING COSTS	
•• PREPOSITION M1A1s	$ 1.669
•• NEW BUY OF M1A1s	42.378
•• TNG AIDS	1.258
•• DUMMY AMMO	23
• RECURRING COSTS (FY 88-91)	
•• NTC AMMO COSTS	38.292
•• TRANSPORT COSTS	178
•• NTC CONTRACT MAINTENANCE COSTS	2.231
TOTAL COSTS	$ 86.029

(28)

Chart 28 shows the costs for Alternative 3, which is Alternative 2 plus a distribution of one M1A1 tank for each POMCUS battalion. Test, measuring, and diagnostic equipment (TMDE) costs are not included. The benefit of providing the unit with one M1A1 tank would be the additional sustainment training made available to the mechanics. This alternative produces the highest cost. The rationale for providing one M1A1 per POMCUS battalion is discussed in Chart 29. AMC has indicated that this alternative would be difficult to support with respect to the M1A1.



The hours of sustainment training estimated per battalion for crews and mechanics are shown in Chart 29. This data was obtained from the US Army Armor School. Based on this requirement, it was determined that only one tank per POMCUS battalion would be required for sustainment training.

US ARMY

CAA

ALTERNATIVE 4
TRANSPORT M1A1 FROM FT BLISS (3ACR)
$ FY 87 (000)

• NON-RECURRING COST		
ADDITIONAL SUPPLIES AND SPARES FOR M1A1		$ 527
• RECURRING COSTS (FY 88-91)		
RAIL COSTS	$522	
OTHER TRANSPORTATION COSTS*	$ 11	
		$ 533
SUB TOTAL		$1,060
• COST OF 120MM TANK ROUNDS (FY 88-91)		$4,787
TOTAL		$5,847

* LOADING/UNLOADING COSTS AT RAILHEAD AND TRANSPORT COSTS FROM/TO RAILHEAD TO NTC

(30)

Chart 30 shows the costs for Alternative 4--transporting M1A1s from Ft Bliss to the NTC as opposed to prepositioning M1A1s at the NTC. The 3ACR is scheduled to go to the NTC three times during FY 88-91 (rotation schedule shown in Appendix E, Table E-3). Since the 3ACR is the only CONUS unit training at the NTC which has M1A1s, some M1A1 supplies and spares would have to be maintained at the NTC. This alternative provided the lowest cost.

US ARMY

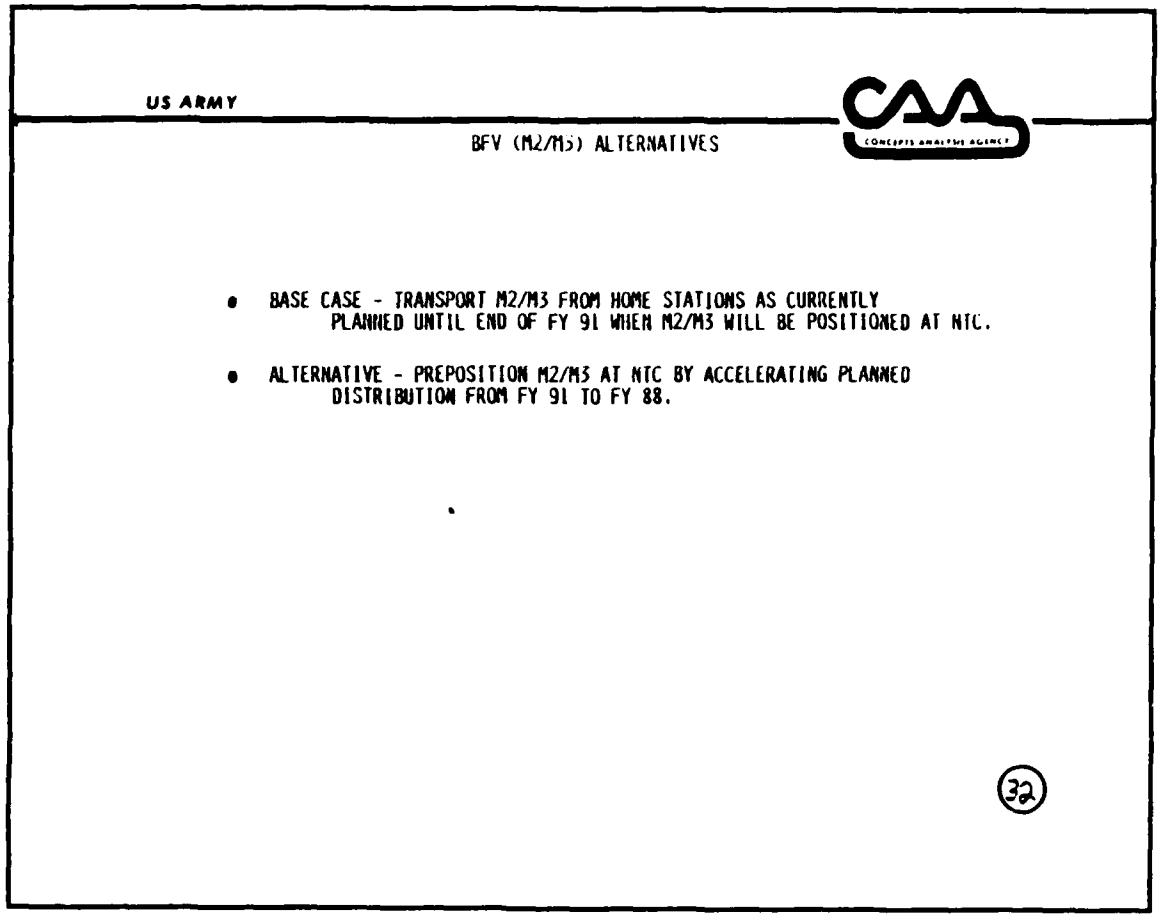
PHASE I SUMMARY COST COMPARISON
(FY 88-91) FOR M1A1 BASE CASE
AND ALTERNATIVES $ FY 87 (000)

	BASE CASE	ALT 1 BASE CASE USING 35MM AMMO DEVICE	ALT 2 BASE CASE PLUS DISTRIBUTE M1A1 TNG AIDS TO EA POMCUS BATTALION	ALT 3 BASE CASE PLUS DISTRIBUTE M1A1 TNG AIDS AND 1 M1A1 PER POMCUS BATTALION	ALT 4 TRANSPORT 3ACR
• NONRECURRING COSTS					
•• PREPOSITION M1A1s	$ 1,669	$ 1,669	$ 1,669	$ 1,669	NA
•• AMMO DEVICE	NA	5,800	NA	NA	NA
•• NEW BUY OF M1A1s	NA	NA	NA	42,378	NA
•• ADD SUPPLIES M1A1s	NA	NA	NA	NA	$ 527
•• TNG AIDS	NA	NA	1,258	1,258	NA
•• DUMMY AMMO	NA	NA	23	23	NA
• RECURRING COSTS (FY 88-91)					
•• NTC AMMO COSTS	38,292	3,651	38,292	38,292	4,787
•• TRANSPORT COSTS	178	178	178	178	533
•• NTC CONTRACT MAINTENANCE COSTS	2,231	2,231	2,231	2,231	0
TOTAL COSTS	$42,370	$13,529	$43,651	$86,029	$ 5,847
POTENTIAL SAVINGS/(LOSS) (FY 88-91)**	NA	$28,841	($ 1,281)	($43,659)	$36,523

(31)

* DOES NOT INCLUDE TMDE COSTS
** SAVINGS = BASE CASE - ALTERNATIVE

Chart 31 provides a summary of the costs and potential savings compared to the base case for the four alternatives examined in Phase I. The largest potential savings occur for Alternatives 1 and 4.



As shown in Chart 32, there are only two alternatives for the BFVs--either continue to transport or preposition at the NTC.

US ARMY

BFV BASE CASE AND ALTERNATIVE COST COMPARISON
$ FY 87 (000)

- BASE CASE--TRANSPORT M2/M3 FROM HOME STATION

	FY 88	FY 89	FY 90	FY 91	TOTAL
TRANSPORTATION COSTS	$1070	$1719	$1908	$2525	$7222
ACCUMULATIVE FROM FY 91	$7222	$6152	$4433	$2525	

- ALTERNATIVE--ACCELERATE PREPOSITIONING OF M2/M3 TO FY 88
  RECURRING CONTRACTOR COSTS FOR FY 88-91 * $ 920
- POTENTIAL SAVINGS $6302

* ANNUAL CONTRACTOR COSTS OF $230,000/YEAR.

(33)

The recurring cost to transfer the BFVs to the NTC over the 4-year period is $7.2 million based on the approved rotation schedule. If BFVs are prepositioned, a contractor cost of $0.9 million is incurred over the period. The potential savings in rail costs are $6.3 million. If BFVs were prepositioned at a later date, for example FY 89, then the costs for the 3-year period would be $6.1 million and potential savings would be equal to $6.152 - 0.920/4 x 3 = $5.5 million. Appendix E, paragraph E-8, provides details on the computation of BFV transportation costs. The equation for computing the accumulative costs by year is shown in Chart 34.

US ARMY

EQUATION FOR COMPUTING BFV BASE CASE TRANSPORT COST

$$\text{ANNUAL TRANSPORTATION COST ESTIMATE FOR BFVs} = \sum_{N=1}^{N} (C_N \times B_N) + (B_N \times \$93.24) + (R \times \$2472)$$

N = NUMBER OF ROTATIONS WITH BFVs

C_N = ROUND TRIP COST PER RAILCAR FOR UNIT ROTATION TO NTC

B_N = NUMBER OF RAILCARS SHIPPED BY UNIT TO NTC PER ROTATION (2 BFVs PER RAILCAR)

R = NUMBER OF ROTATIONS IN GIVEN YEAR

$93.24 = LOAD/UNLOAD COSTS PER RAILCAR PER ROTATION

$2472 = TRANSPORT COST TO/FROM RAILHEAD TO/FROM NTC PER ROTATION

(34)

The equation for computing the annual rail costs for transporting BFVs is as shown in Chart 34. The number of rotations per year is dependent upon the rotation schedule for FY 88 through FY 91.

US ARMY

RANKING OF TRAINING SUITABILITY •

- MOST SUITABLE
  - •• UNIT HAS EQUIPMENT. TRAINS ON SAME EQUIPMENT AT NTC. FALLS IN ON SAME EQUIPMENT IN WAR.
- SUITABLE
  - •• UNIT HAS EQUIPMENT. TRAINS ON MODERNIZED/DIFFERENT EQUIPMENT AT NTC. FALLS IN ON NTC TYPE EQUIPMENT IN WAR.
- LESS SUITABLE
  - •• UNIT HAS EQUIPMENT. TRAINS AT NTC ON SAME EQUIPMENT. FALLS IN ON MODERNIZED/DIFFERENT EQUIPMENT IN WAR.
- TRAIN AS...FIGHT CRITERION

(35)

The three categories of training suitability considered are shown in Chart 35. The "most suitable" category occurs when the unit trains on the same equipment with which it goes to war and has at home station. The category of training labeled "suitable" occurs when a unit trains at NTC on the same type of equipment that it would go to war with, but possesses an unmodernized set of equipment at home station. The "less suitable" training category occurs when a unit trains on unmodernized equipment at NTC and at home station, but uses modernized equipment in wartime. For the "less suitable" example, a force unit may have M113s, train at NTC on M113s, but go to war with BFVs.

US ARMY

QUALITATIVE TRAINING CONSIDERATIONS

- TRAINING, NOT EQUIPMENT, IS PRINCIPAL FACTOR IN COMBAT CAPABILITY AT NTC.
- PERSONNEL TURBULENCE REDUCES TRAINING BENEFITS UPON RETURN TO HOME STATION.
  - AT PLATOON LEVEL, TRAINING BENEFIT HALF-LIFE IS REPORTABLY ABOUT 3 MONTHS*--MORE FREQUENT TRAINING REQUIRED TO MAINTAIN HIGH TRAINING BENEFIT LEVEL.
  - UNITS TRAINING ON M1A1 TANKS, BUT WITH M1 TANKS AT HOME STATION, MAY REQUIRE A SUSTAINMENT TRAINING PACKAGE AS PROPOSED BY USAARMC, AND PERIODIC TRAINING VIA A ROLLOVER.

* REF: NTC COMMANDER's MEMORANDUM, 20 NOVEMBER 1985

(36)

Phase I qualitative training considerations are shown in Chart 36. The use of tactics (training) is the prime consideration for training exercises at NTC. However, training benefits are reportedly short-lived due to personnel rotation, promotions, etc. A sustainment training package should be implemented which includes training aids.

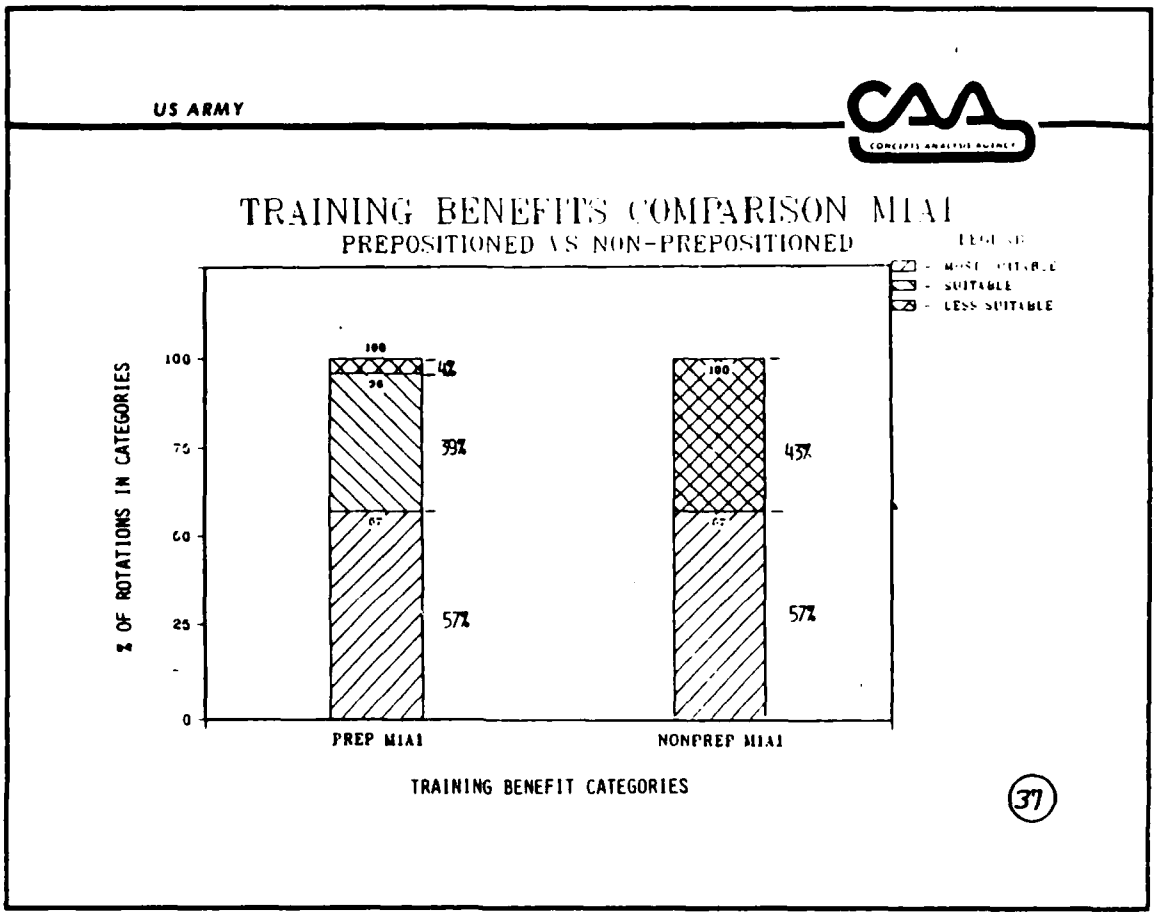
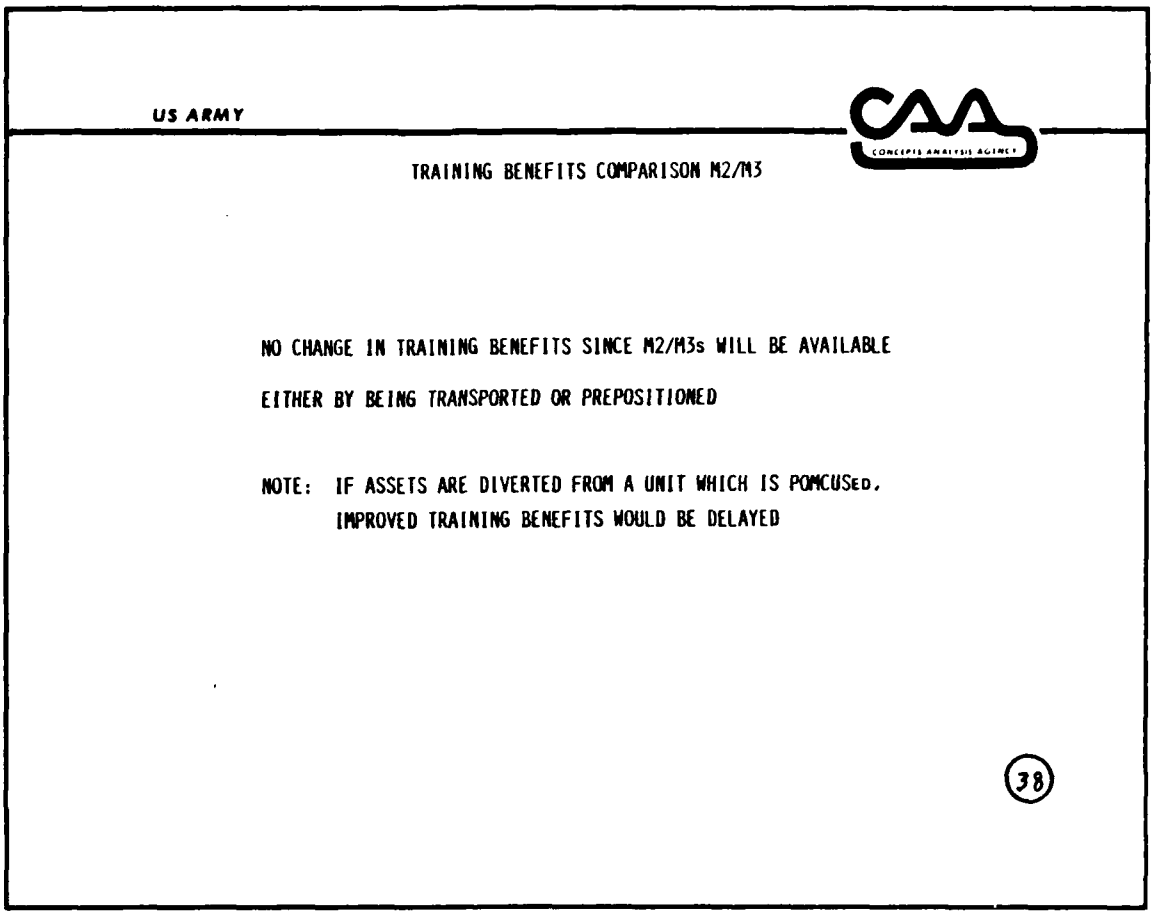


Chart 37 compares the training benefits of prepositioning M1A1s at NTC versus transporting. If M1A1s were prepositioned at NTC, the training benefits would increase to 39 percent in the "suitable" category with a corresponding decrease in the "less suitable" category versus nonprepositioning. Training percentages were computed for all rotations, FY 88-91.

NOTE: The most suitable training category precentage reflects the percent of total rotations that would train on the same tanks with which it would go to war and use at home station. The suitable training category percentage reflects the percent of total rotations that would train on the tanks it would go to war with, but possess different (unmodernized) tanks at home station. The less suitable category percentage reflects the percent of total rotations that would train at NTC on the same tanks that it has at home station but would go to war with different (modernized) tanks.



The comparison of training benefits for the BFVs shows no change and would fall into the "most suitable" category. The reason for the high training category is that a CONUS-based force unit will not receive BFVs until BFVs are placed in POMCUS. If, at rotation time, NTC does not have BFVs, they would be transported from home station, thus maintaining the high training category. The same result would be achieved if BFVs were prepositioned at NTC. However, if assets were diverted from a force unit for a period of time, that unit would not receive training or modernized equipment as early as planned.

US ARMY

PHASE I FINDINGS
BASE CASE vs POTENTIAL SAVINGS/(LOSS)
FOR ALTERNATIVES $ FY 87 (000)

	COSTS SAVINGS (LOSS)	PERCENT CHANGE COSTS	TNG BENEFITS**
• PREPOSITION MIAIs			
•• BASE CASE*	--	--	---***
•• ALT 1 - BASE CASE WITH AMMO DEVICE	$28,841	70% LESS	SAME
•• ALT 2 - BASE CASE PLUS MIAI TNG AIDS	($ 1,281)	3% MORE	SAME
•• ALT 3 - BASE CASE AND TNG AIDS PLUS 1 MIAI PER POMCUS BATTALION AT HOME STATION	($43,659)	103% MORE	SAME
• TRANSPORT MIAIs			
•• ALT 4 - TRANSPORT 3ACR	$36,523	86% LESS	39% REDUCTION IN 'SUITABLE' CATEGORY

* $42,370 COST FOR FY 88-91
** AS A % OF TOTAL ROTATIONS
*** TNG BENEFITS BASE CASE = MOST SUITABLE 57%, SUITABLE 39%, LESS SUITABLE 4%

(39)

The Phase I findings are shown in Charts 39 and 40. The lowest cost alternative is to continue transporting the M1A1s; however, some reduction in training benefits is noted. Chart 39 shows the relative differential cost of the alternatives. Costs of NTC operations and costs for training force units were not factored in the costs for the alternatives since these costs would occur under all alternatives.

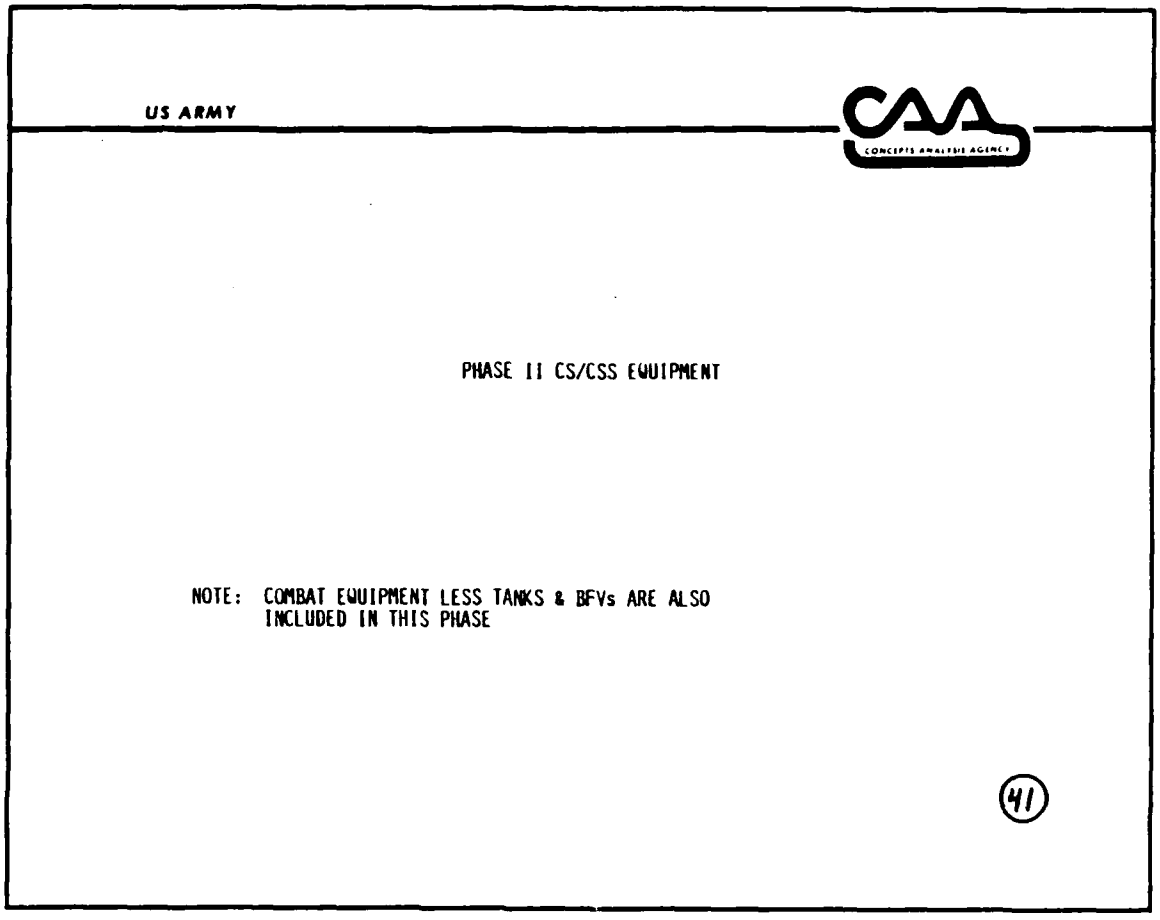
US ARMY

PHASE I FINDINGS (CONT.)

- ACCELERATED FIELDING OF BFVs AT NTC:
  - REDUCES COSTS BY $6.3 MILLION FY 88-91 IF BFVs FIELDED IN FY 88 INSTEAD OF FY 91
  - TRAINING BENEFITS UNCHANGED WITH ONE EXCEPTION. IF BFVs ARE DIVERTED FROM A UNIT, THEN IMPROVED TRAINING BENEFITS FOR THAT UNIT, IF POMCUSED, WOULD BE DELAYED

(40)

Findings for the BFVs are shown in Chart 40. If the planned positioning of the BFVs could be accelerated, potential costs could be reduced by $6.3 million.



Phase II addresses all wheeled and tracked vehicles except for the tanks (M1, M1A1) and BFVs discussed in Phase I.

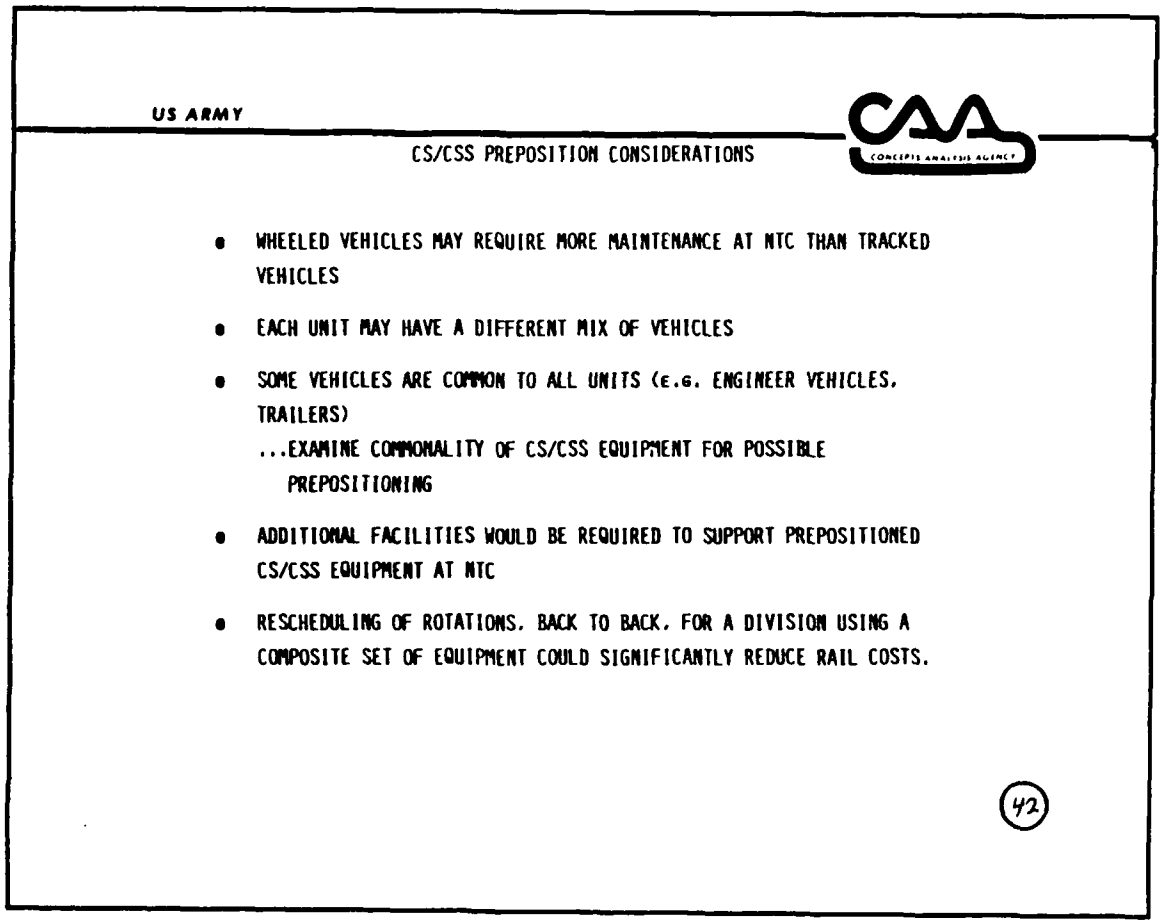


Chart 42 shows the areas that were considered in addressing the issue of prepositioning CS/CSS equipment at the NTC. Some of these considerations are addressed in the alternatives.

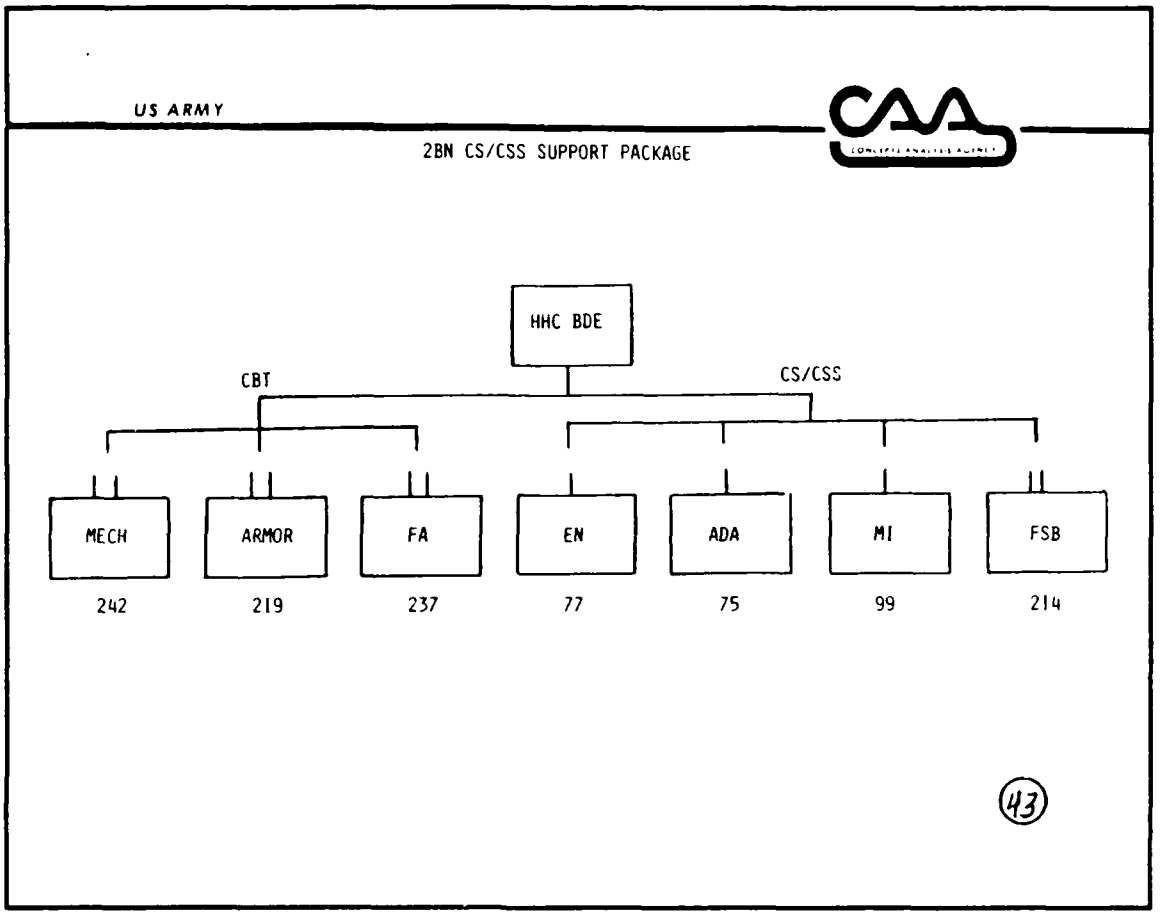
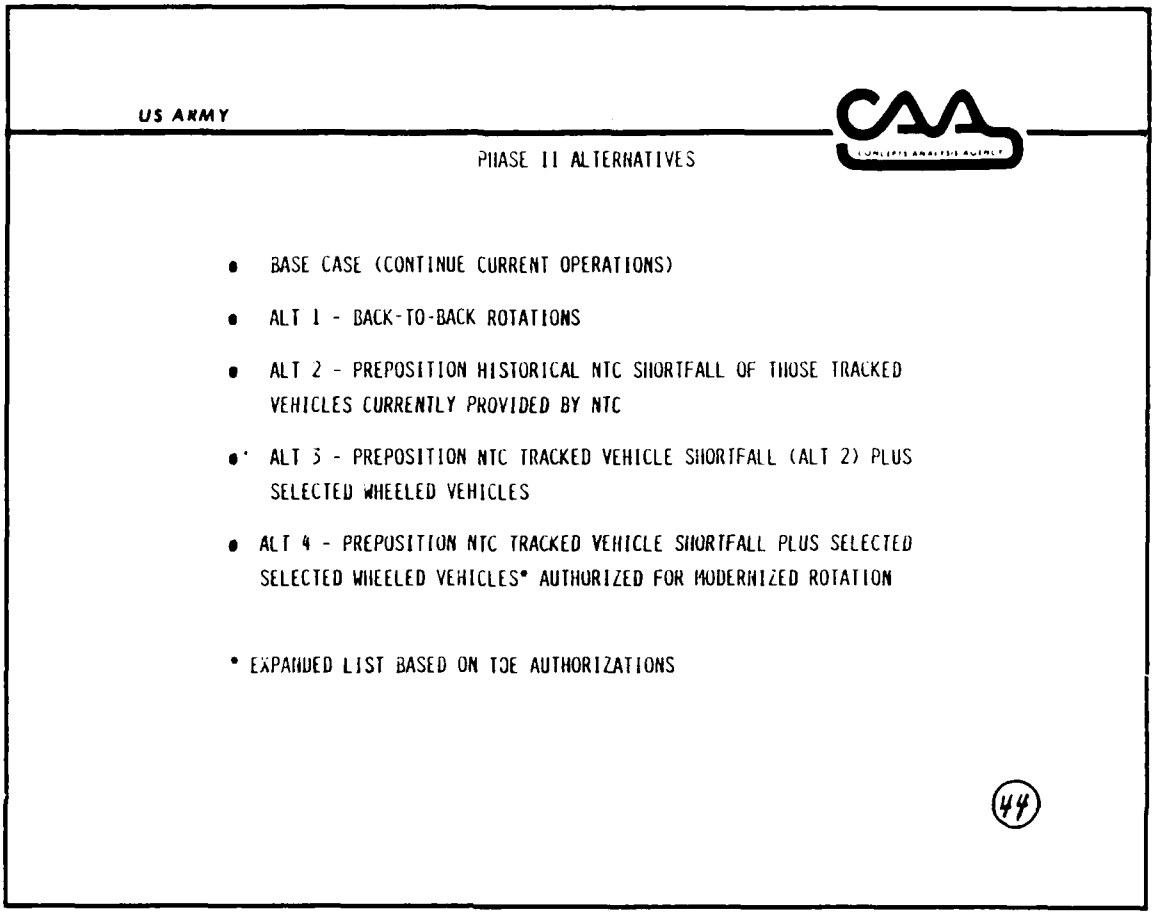


Chart 43 shows the CS/CSS support package considered for the two-battalion rotation. The number of vehicles involved is subscripted below the units. The support structure would increase when the three-battalion concept is implemented in the future.



The base case and alternatives are listed in Chart 44. Alternatives 2, 3, and 4 are accumulative and progressively increase the number of vehicles which would be prepositioned at NTC. Alternative 1 involves a change in the rotation schedule.

US ARMY

BASE CASE
EXAMPLES OF EQUIPMENT COMMONLY TRANSPORTED TO NTC

AVLB ARMOR VEHICLE LAUNCH BRIDGE
D7 DOZER
M1008 5/4 TON CARGO TRUCK
M1009 3/4 TON UTILITY TRUCK
M101 3/4 TON CARGO TRAILER
M105 1½ TON CARGO TRAILER
M106 MORTAR CARRIER
M109 2½ TON SHOP VAN TRUCK
M113 TRACKED PERSONNEL CARRIER
M131 5000 GALLON FUEL TANK SEMI TRAILER
M134 STINGER WITH CARRIER
M149 WATER TANK TRAILER
M151 ¼ TON UTILITY TRUCK
M153 SELF PROPELLED 20MM AIR DEFENSE GUN
M35 2½ TON CARGO TRUCK
M332 AMMO TRAILER
M48A1 CHAPPARAL MISSILE SYSTEM
M416 ¼ TON CARGO TRAILER
M54 5 TON CARGO TRUCK
M548 6 TON TRACKED CARGO CARRIER
M561 5/4 TON CARGO TRUCK
M577 COMMAND POST CARRIER
M578 TRACKED RECOVERY VEHICLE
M728 COMBAT ENGINEER VEHICLE
M88 RECOVERY VEHICLE

(45)

Chart 45 displays examples of CS/CSS equipment that are currently being transported by rail to the NTC.

US ARMY

SHIPPING CARGO BY VEHICLE VS CONEX CONTAINER

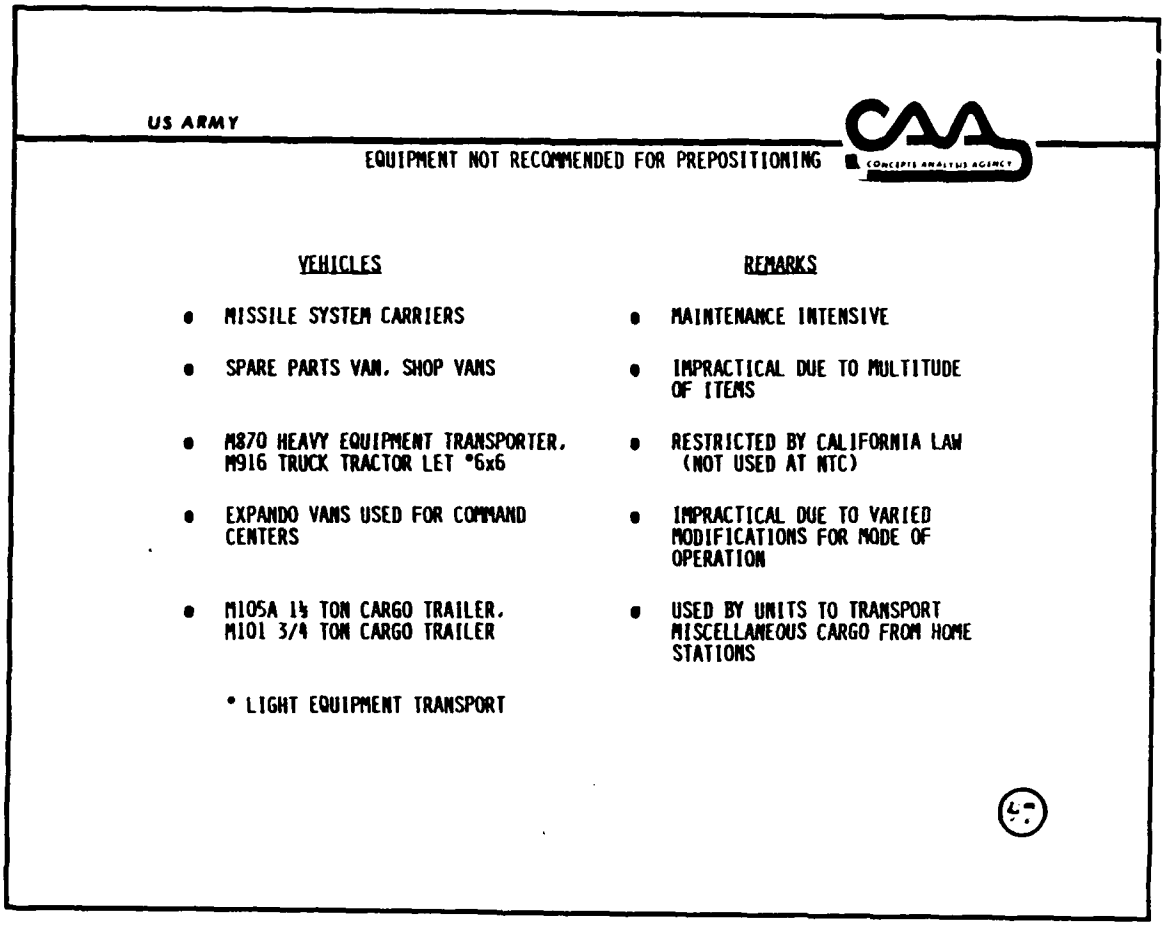
CARGO TRUCKS	VEHICLES/RAILCAR	CUBIC FEET (CU)*	PERCENT OF RAILCAR FILLED WITH EQUIV CARGO IN CONEX CONTAINERS**
M1008 5/4 TON CARGO TRUCK	3	256	21.12%
M54 5 TON CARGO TRUCK	3	500	41.2%
TRAILERS			
M101 3/4 TON CARGO TRAILER	7	153	29%
M105 1½ TON CARGO TRAILER	7	248	48%
M416 ¼ TON CARGO TRAILER	7	28	5%

* CALCULATED AT 90% FILL

** ONE (8'6" x 6'3" x 6'11") CONEX CONTAINER USES 366 CU WITH 11 PER RAILCAR = 4041 CU FT X 90% FILL = 3636

(46)

If trucks and trailers were prepositioned at NTC, then some means of handling loose cargo would be required. An analysis was conducted to determine the effect of shipping loose cargo in CONEX containers versus transporting in vehicles loaded on railcars. CONEX containers occupy 20 to 48 percent of an equivalent railcar.



Certain equipment is not normally considered for prepositioning at NTC. Chart 47 lists the main types of equipment that were not considered for prepositioning and the rationale for excluding them.

US ARMY

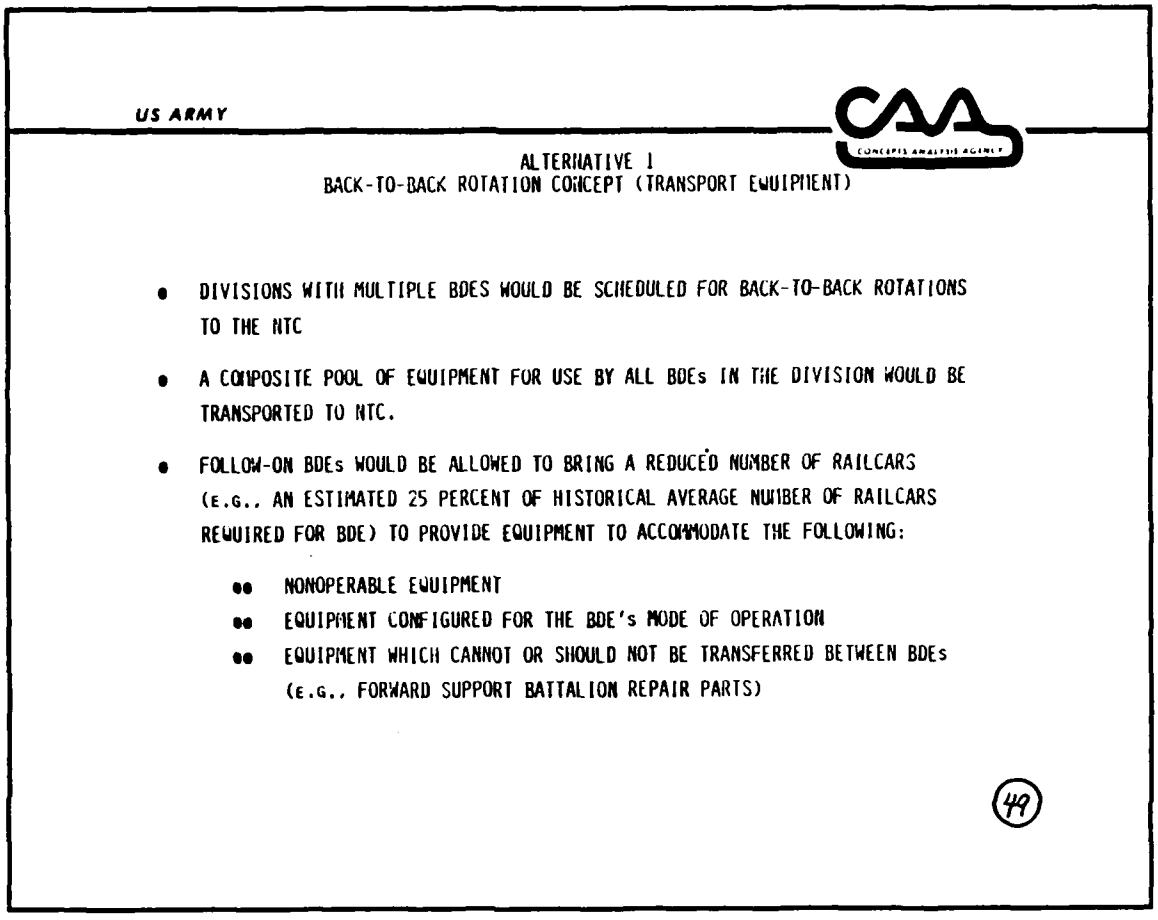
BASE CASE - ESTIMATED RAIL COSTS FY 88-91
FY 87 CONSTANT DOLLARS

HOME STATION	# ROTATIONS (FY 88-91)*	AVG RAILCARS PER ROTATION	AVG ROUND TRIP COST PER RAILCAR	TOTAL EST RAIL COSTS $(000)
3ACR	3	300	$6,000	$ 5,400
5ID	7	225	9,214	14,512
1ID	8	301	8,488	20,439
24ID	8	280	7,912	17,723
4ID	9	360	2,030	6,577
194BDE	3	400	5,944	7,133
197BDE	3	167	5,934	2,973
2AD/1CD	15	400	7,932	47,592
		SUBTOTAL		$122,349
		OTHER TRANSPORT COSTS (FY 88-91)		200
		TOTAL (FY 88-91)		$122,549

* 14 ROTATIONS/YEAR

(48)

Chart 48 shows the methodology for computing the rail costs for the base case based on the current rotation schedule shown in Table E-3. Other transport costs include loading/unloading costs and transportation to and from the railhead and the NTC.



Currently, force units transport most of their own equipment, except for prepositioned equipment, to NTC. As a result, equipment may be offloaded at the railroad terminal while another force unit's similar type equipment is being loaded. By changing the rotation schedule, one set of composite equipment (for rotating units from the same home stations) could be used for two or three rotations, saving transportation costs.

US ARMY

CAA
CONCEPTS ANALYSIS AGENCY

ALTERNATIVE 1 (CONT.)
ADVANTAGES AND DISADVANTAGES
OF BACK-TO-BACK ROTATIONS

- ADVANTAGES:
  - REDUCES RAIL TRANSPORTATION COSTS EACH CYCLE
  - DIVISIONS WOULD USE THEIR OWN EQUIPMENT
  - REDUCES AMOUNT OF EQUIPMENT THAT WOULD HAVE TO BE PREPOSITIONED AT THE NTC
- DISADVANTAGES:
  - LIMITED PROPERTY ACCOUNTABILITY
  - OPERATORS WOULD TEMPORARILY LOSE CONTROL OF THEIR EQUIPMENT
  - NORMAL TRAINING CYCLES WOULD BE DISRUPTED
  - UNITS AT HOME STATION COULD TEMPORARILY BE WITHOUT EQUIPMENT
  - CSS PERSONNEL MAY BE DEPLOYED FOR DURATION OF ALL BDE ROTATIONS WITHIN A DIVISION

(50)

Listed in Chart 50 are some of the significant advantages and disadvantages for Alternative 1. Considerable resistance by FORSCOM units to implement this alternative is anticipated.

US ARMY

ALTERNATIVE 1
ESTIMATED 18-MONTH RAIL COST SAVINGS FOR
BACK-TO-BACK ROTATION

HOME STATION		AVERAGE # OF R/C	AVG R/C* COST IN $FY 87	BDEs IN CYCLE**	# R/C IN 18-MONTH CYCLE	ESTIMATED # R/C IN B/B 18 MO CYCLE	TOTAL ESTIMATED SAVINGS $FY 87 (000)
FT HOOD	2AD	400	$3,966	2	800	500	$2,380
FT HOOD	1CD	400	3,966	3	1200	600	$4,759
FT KNOX	197BDE	400	2,972	1	400	400	$ 0
FT STEWART	24ID	280	3,956	3	840	420	$3,323
FT CARSON	4ID	360	1,015	3	1080	540	$1,096
FT BENNING	194BDE	167	2,967	1	167	167	$ 0
FT RILEY	1ID	301	4,244	3	903	451	$3,837
FT POLK	5ID	225	4,607	1	675	337	$3,114
FT BLISS	3ACR	NA	$3,000	1	NA	NA	$ 0
			POTENTIAL SAVINGS				$18,509

R/C = RAILCARS
B/B = BACK TO BACK ROTATIONS
NA - NOT AVAILABLE
* ONE WAY COST
** CYCLE = 18 MONTHS

(51)

The cost savings that is estimated to occur with back-to-back rotations was calculated for an 18-month cycle and then prorated on a per-year basis. The brigade (BDE) for the two battalion rotations consists of two battalions and a slice of brigade headquarters.

US ARMY

CAA CONCEPTS ANALYSIS AGENCY

ALTERNATIVES 2, 3 AND 4
NUMBER OF VEHICLES CONSIDERED FOR PREPOSITIONING

ALTERNATIVE	NUMBER OF VEHICLES		
	TOE AUTHORIZATION (VEHICLE TYPES W/NTC SHORTFALL)*	NTC PROVIDES	BALANCE REQUIRED
ALTERNATIVE 2 - PREPOSITION NTC SHORTFALL OF TRACKED VEHICLES CURRENTLY PROVIDED BY NTC	135	51	84
ALTERNATIVE 3 - PREPOSITION NTC SHORTFALL OF TRACKED VEHICLES (ALT 2) PLUS NTC-SELECTED WHEELED VEHICLES	941	51	890
ALTERNATIVE 4 - PREPOSITION NTC SHORTFALL OF TRACKED VEHICLES (ALT 2) PLUS SELECTED WHEELED VEHICLES AUTHORIZED FOR MODERNIZED ROTATION.	1175	53	1122

* EXCLUDES VEHICLE TYPES NOW PROVIDED BY NTC NOT HAVING SHORTFALL

(52)

Chart 52 shows the total quantities of vehicles considered for prepositioning at the NTC. The BFVs and vehicle types now provided by NTC not having a shortfall were excluded. These vehicles were selected after reviewing TOE and MTOE equipment recapitulations for modernized units participating in the current brigade slice rotations. Alternatives 3 and 4 require the largest number of vehicles to be prepositioned at the NTC.

US ARMY

ALTERNATIVE 2 - COST TO PREPOSITION TRACKED VEHICLE SHORT FALL AT NTC
FY 87 $(000)

	NONRECURRING COSTS		ANNUAL RECURRING COSTS
EQUIPMENT (VEHICLES)	NA*		
FACILITIES	$1470	LABOR (CONTRACT MAINT)	$1320
TOOL SETS	84	FACILITY MAINT	132
TOTAL	$1554	TOTAL	$1452

* EQUIPMENT ASSUMED TO COME FROM EXISTING ASSETS

(53)

Chart 53 shows the nonrecurring costs for Alternative 2. Appendix F, paragraph F-5, provides additional discussion on the annual recurring costs.

US ARMY

ALTERNATIVE 3 - COST TO PREPOSITION NTC SELECTED VEHICLES AT NTC, $ FY 87 (000)

	NONRECURRING COSTS*		ANNUAL RECURRING COSTS
EQUIPMENT (VEHICLES)	NA**		
FACILITIES	$5615	LABOR (CONTRACT MAINT)	$4336
TOOL SETS	199	FACILITIES AND CONTRACTOR EQUIPMENT MAINT	560
WASH RACKS	195	CLASS IX ASL MGMT	454
GREASE RACK	325	CONTRACTOR MONITOR SALARIES	120
CONTRACTOR EQUIP	982	COMMUNICATIONS/ ELECTRONIC MAINT	968
		ALT 2 ANNUAL RECURRING COST	1452
TOTAL	$7316	TOTAL	$7890

* INCLUDES NONRECURRING COSTS FOR ALT 2
** ASSUME VEHICLES COME FROM EXISTING ASSETS

(54)

The nonrecurring and recurring costs for Alternative 3 are shown in Chart 54. Contractor monitor salaries are for additional civil service personnel required to monitor contracts; communications/electronics maintenance is for organizational level through general support level maintenance and installation of equipment, primarily radio components. Appendix F, paragraph F-5, provides additional discussion on recurring costs.

US ARMY

CAA CONCEPTS ANALYSIS AGENCY

ALTERNATIVE 4 - COST TO PREPOSITION VEHICLES AT NTC
FY 87 $(000)

	NONRECURRING COSTS*		ANNUAL RECURRING COSTS
EQUIPMENT (VEHICLES)	NA**		
FACILITIES	$7,184	LABOR (CONTRACT MAINT)	$6,172
TOOL SETS	215	FACILITIES AND CONTRACTOR EQUIPMENT MAINTENANCE	718
WASH RACKS	277	CLASS IX ASL MGMT	477
GREASE RACK	390	COMMUNICATIONS/ ELECTRONIC MAINT	968
CONTRACTOR EQUIP	982	CONTRACTOR MONITOR SALARIES	120
(SAFETY EQUIP) (MAINT TRUCKS) (UNIFORMS) (TEST SETS)		ALT 2 ANNUAL RECURRING COSTS	1,452
TOTAL	$9,048	TOTAL	$ 9,907

* INCLUDES NONRECURRING COSTS FOR ALT 2
** ASSUME VEHICLES COME FROM EXISTING ASSETS

(55)

Chart 55 shows the nonrecurring and recurring costs for Alternative 4. Appendix F, paragraph F-5, provides additional discussion on recurring costs.

US ARMY

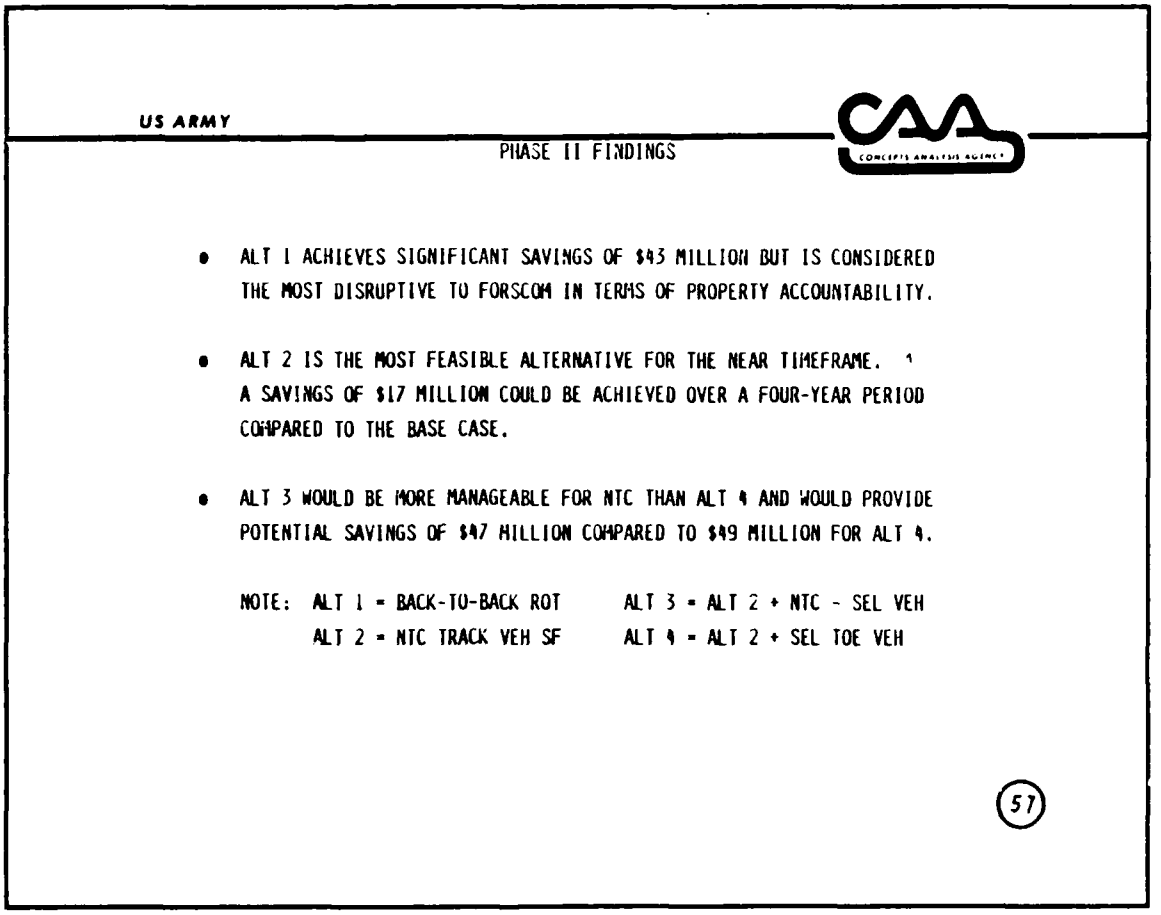
PHASE II SUMMARY COST COMPARISON (FY 88-91)
OF BASE CASE AND ALTERNATIVES $ FY 87 (000)

		ALTERNATIVES			
COSTS	BASE COST TRANSPORT	ALT 1 - BACK-TO-BACK ROTATION	ALT 2 - TRACKED VEH SHORTFALL	ALT 3 - SHORTFALL PLUS NTC SEL VEH	ALT 4 - SHORTFALL PLUS TOE SEL VEH
• NONRECURRING	--	--	$ 1,554	$ 7,316	$ 9,048
• RECURRING FY 88-91*	$122,549	$79,208	$104,192	$68,351	$64,868
SUB TOTAL	$122,549	$79,208	$105,746	$75,667	$73,916
• POTENTIAL SAVINGS COMPARED TO BASE CASE (FY 88-91)	--	$43,341	$ 16,803	$46,882	$48,633

* INCLUDES REMAINING RAIL COSTS

(56)

Chart 56 contains a summary cost comparison of the base case and alternatives considered. As described earlier, Alternatives 2 through 4 progressively increase the number of vehicles to be prepositioned at the NTC. Alternative 1 provides substantial savings of $43 million with no additional prepositioning at NTC. Alternative 3 would provide a potential saving of $47 million with prepositioning. Additional prepositioning of 25 percent more vehicles provides increased savings to $49 million or 4 percent--not a large increase in savings.



Findings for Phase II, CS/CSS equipment are shown in Chart 57. Alternative 1 requires no additional prepositioning. Alternative 2 could be achieved with limited increased prepositioning at NTC and is considered the most feasible alternative. Alternatives 3 and 4 require substantial prepositioning at NTC, the fleet of equipment would be aged rapidly, and vehicles would have to be obtained from existing assets.

US ARMY

OTHLR CONSIDERATIONS

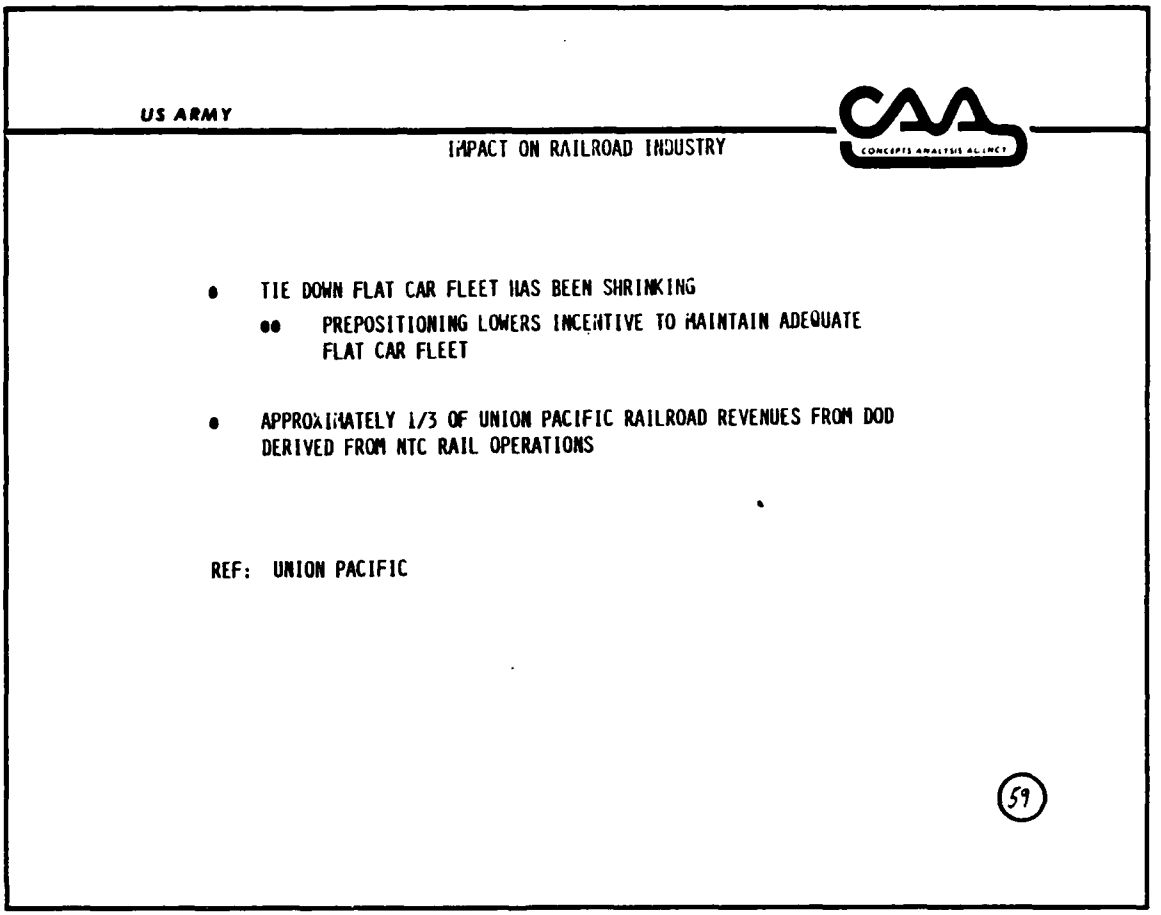
PREPOSITIONED EQUIPMENT USED FOR SUSTAINED NTC OPERATIONS WOULD ENABLE AMC TO:

- VALIDATE ENGINEERING ESTIMATES ON EQUIPMENT
- IDENTIFY POTENTIAL SAFETY PROBLEMS CAUSED BY LONG TERM USAGE
- IDENTIFY DESIGN PROBLEMS AFFECTING EQUIPMENT PERFORMANCE/READINESS
- VALIDATE/DEVELOP COMBAT ASLs/PLLs/MPLs
- IDENTIFY REPAIR PARTS WHICH HAVE GREATEST IMPACT ON IMPROVED UNIT READINESS
- TRACK/VALIDATE EQUIPMENT PERFORMANCE AND READINESS DURING SUSTAINED HIGH INTENSITY OPERATIONS
- VALIDATE/DEVELOP/PREDICT LIFE OF EQUIPMENT BY TYPE OF OPERATIONS AND COMPUTE SUPPORT COSTS
- VALIDATE PROJECTED SERVICE LIFE OF EQUIPMENT

SOURCE: AMC

(58)

AMC is interested in collecting data on certain items of equipment, especially modernized equipment. Prepositioning such equipment at NTC would provide AMC data to support their "lead the fleet" concept where vehicles would be aged, due to use, very rapidly. Benefits obtained from this concept are listed in Chart 58. Prepositioning all CS/CSS equipment would not be necessary to achieve this goal.



Union Pacific is the carrier that is responsible for over 80 percent of the railroad traffic to the NTC. DA has recently encouraged the railroads to increase and upgrade the tiedown flatcar fleet. Prepositioning could eliminate the incentive on the part of the railroads to do this. Prepositioning may have a detrimental financial impact on the railroads, which could be a concern because of the role the railroads would play in the event of mobilization.

US ARMY

ANALYSIS OF EXTENSION OF RAILHEAD TO FT IRWIN

- A COST PROPOSAL WAS MADE TO EXTEND RAILHEAD 50 MILES TO FT IRWIN AT A COST OF $57 MILLION IN 1986. A REVISED PROPOSAL COULD REDUCE MILEAGE TO APPROXIMATELY 25 MILES AT AN ESTIMATED COST OF $29 MILLION.
- THE AVERAGE COST TO DRIVE VEHICLES 33 TO 37 MILES ACROSS THE DESERT IS ESTIMATED AT $5/MILE. (TANKS $67/MILE)
- AVERAGE NUMBER OF VEHICLES PER ROTATION IS 850. COST EQUATES TO 850 x 35 x 5 = $148,750 PER ROTATION, $2,082,500/YEAR.
- YEARS TO BREAK EVEN POINT IS APPROXIMATELY 14 YEARS.
- PREPOSITIONING EQUIPMENT INCREASES NUMBER OF YEARS TO BREAK EVEN POINT.

(60)

NTC requested a cost estimate to extend the railhead to Ft Irwin. The railroad estimated a cost of $57 million in 1986. By revising the route, the cost may be lowered to $29 million. A CAA limited analysis shows that the $29 million costs could be recovered in approximately 14 years. Other benefits are safety related since some vehicles will not be transported via commercial carriers on the roads. Also, savings in time would be realized since the cross-country tank-trail march would not be required. Offsetting considerations are increased prepositioning and full brigade operations of three battalions in the future.

US ARMY

IMPACT OF THREE BATTALION ROTATION
ON RAIL CAR REQUIREMENTS PER AVERAGE ROTATION
$ FY 87

THIRD BN	ADDITIONAL REQUIRED EQUIPMENT	ADDITIONAL EQUIPMENT TO BE TRANSPORTED	# OF ADDITIONAL RAIL CARS REQUIRED	AVG COST TO TRANSPORT 3D BN
MECH INFANTRY BN	242	220*	83	$634,718
OR				
ARMOR INFANTRY BN	219	219*	82	$626,316

* 22 M113 AVAILABLE AT NTC

(61)

Chart 61 provides a preliminary assessment of the impact on rail transportation from adding a third battalion to NTC rotations. Appendix G provides a preliminary listing of the equipment required for a three-battalion rotation. The costs are computed for transportation.

US ARMY

CAA CONCEPTS ANALYSIS AGENCY

COST OF PREPOSITIONING 2D FLEET* OF BFVs
AT NTC FOR 3 BN ROTATIONS IN FY 90-91 $FY 87 (000)

• NONRECURRING COSTS	
•• PROCUREMENT COSTS	$ 109,500
•• CONSTRUCTION, OMA-SECURITY FENCING FOR M2/M3 AND STORAGE FACILITIES FOR ADD'L SPARE PARTS	$ 294
•• ADDITIONAL SUPPLIES	$ 262
• RECURRING COSTS (FY 90-91)	
•• CONTRACTOR COSTS	$ 460
TOTAL	$ 110,516 ($1,016 WITHOUT ADDITIONAL BUY)

* 75 BFVs INCLUDES FLOAT OF 15

62

Chart 62 estimates the cost of prepositioning a second fleet of BFVs at the NTC to accommodate a three-battalion rotation. Sometime in the future the two-battalion rotations can be accommodated by one fleet plus floats.

US ARMY

CONCEPTS ANALYSIS AGENCY

QUALITATIVE ANALYSIS/OBSERVATIONS

- PREPARATION FOR ROTATION. CURRENTLY, UNITS RECEIVE TWO YEARS' NOTICE WITH A NORMAL PREPARATION TIME OF 18 MONTHS. PREPOSITIONING EQUIPMENT AT NTC COULD REDUCE PREPARATION TIME.
- FULL BRIGADE ROTATION. BEFORE FULL BRIGADE ROTATION CAN OCCUR, NTC MUST HAVE SUFFICIENT LEAD TIME TO BUILD UP THE OPPOSING FORCE AND TO PROVIDE FOR ADDITIONAL PERSONNEL, FACILITIES AND EQUIPMENTS WHICH MAY REQUIRE LEAD TIMES OF UP TO EIGHT YEARS.
- NTC WATER RESOURCES. WATER RESOURCES AT NTC MAY BE LIMITED. INCREASED ACTIVITY AT NTC WOULD LIKELY DRAW DOWN THESE RESOURCES EVEN FASTER.

(63)

Some relevant observations that were noted during the course of the study are mentioned in Charts 63 and 64 for consideration by the decisionmaker.

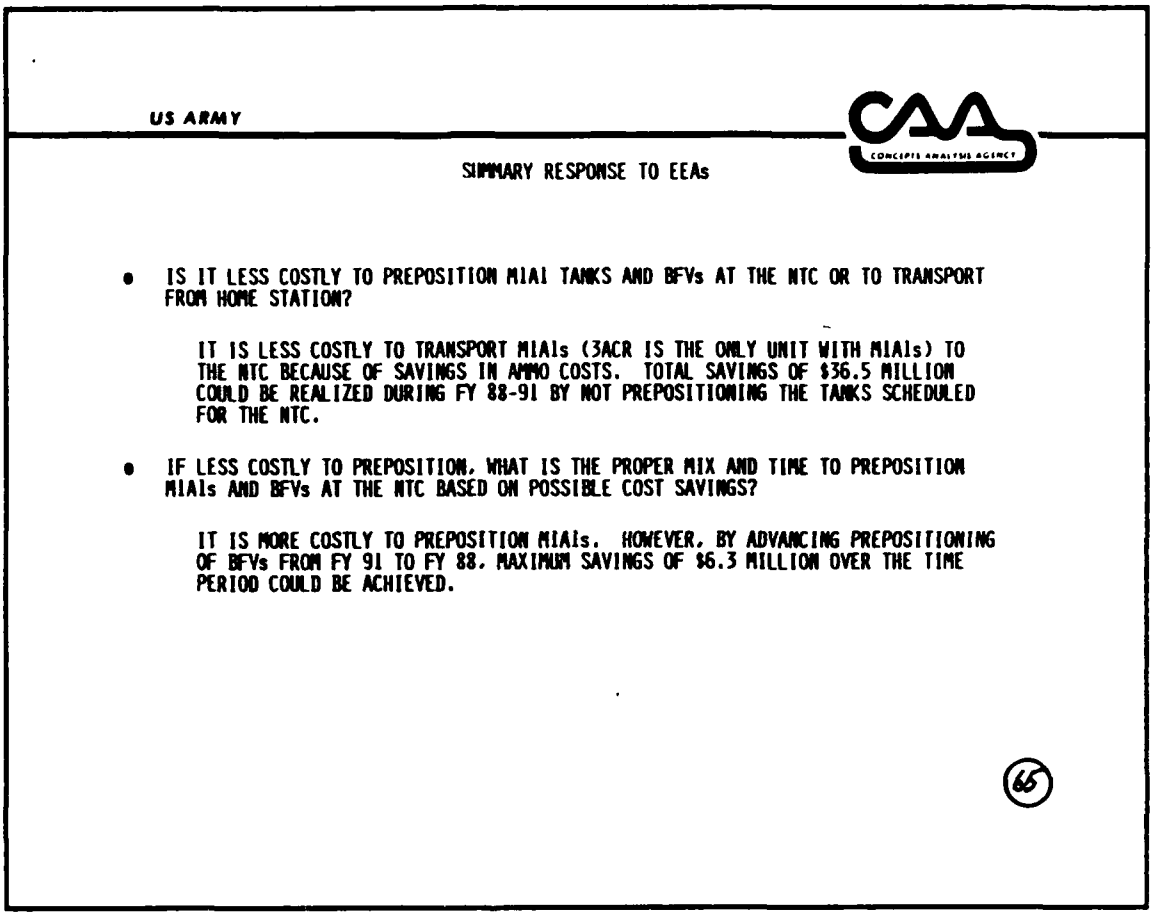
US ARMY

CONCEPTS ANALYSIS AGENCY

QUALITATIVE ANALYSIS/OBSERVATIONS (CONT.)

- TRAINING PROBLEM. NTC CHARTER DOES NOT PROVIDE FOR 'UP-TRAINING.' UNITS MAY FALL IN ON MODERNIZED PREPOSITIONED EQUIPMENT (E.G. M1A1, M2/M3) BEFORE THIS EQUIPMENT IS RECEIVED AT HOME STATION.
- AMMO FUNDING. CONGRESS HAS HISTORICALLY CUT THE AMMO BUDGET TO MEET FISCAL CONSTRAINTS.
- IMPACT ON RAILROAD. REDUCING RAIL SERVICES REQUIRED FOR NTC ROTATIONS DIMINISHES INCENTIVE OF RAILROAD INDUSTRY TO UPGRADE AND INCREASE THE POOL OF CHAIN DOWN FLAT CARS AS REQUESTED BY DOD.
- COMMANDER FLEXIBILITY. EXCEPT FOR COST CONSTRAINTS, COMMANDERS ARE CURRENTLY NOT LIMITED TO THE AMOUNT OR TYPE OF EQUIPMENT TRANSPORTED TO NTC. LIMITING COMMANDERS TO TRANSPORTING ONLY AUTHORIZED TOE EQUIPMENT IS MORE COMPATIBLE WITH POMCUS EQUIPMENT CONSTRAINTS.

(64)



Charts 65 through 67 list the EEAs and the responses determined in the study. All EEAs were answered.

US ARMY

SUMMARY RESPONSE TO EEAs (CONT.)

- WHEN SHOULD THE M1A1 TANKS AND BFVs BE AVAILABLE AT NTC TO MAXIMIZE TRAINING BENEFITS, I.E. GIVEN THAT UNITS TRAINING WITH M1 OR M1A1 TANKS SHOULD HAVE BFVs IN SUPPORT?

  MAXIMUM TRAINING BENEFITS WOULD BE ACHIEVED BY PREPOSITIONING THE M1A1s AT NTC IN FY 89 AND FY 90 AS SCHEDULED. TRAINING BENEFITS FOR THE BFV ARE NOT AFFECTED BY PREPOSITIONING.

- WHAT ARE THE TRAINING BENEFITS? BENEFITS ARE TO BE ASSESSED BY DETERMINING THE NUMBER OF UNITS PER YEAR TRAINING IN VARIOUS QUALITATIVE TRAINING CATEGORIES, E.G. MAXIMUM BENEFIT IS ACHIEVED BY UNIT POSSESSING AND TRAINING WITH SAME TYPE OF EQUIPMENT IT IS DESIGNATED TO USE IN WARTIME.

  IF M1A1s ARE PREPOSITIONED, 57 PERCENT OF ALL ROTATIONS (FY 88-91) WOULD FALL IN THE 'MOST SUITABLE' TRAINING CATEGORY, 39 PERCENT IN THE 'SUITABLE' CATEGORY, AND 4 PERCENT IN THE 'LESS SUITABLE' CATEGORY. NOT PREPOSITIONING M1A1s RESULTS IN THE 39% 'SUITABLE' ROTATIONS BECOMING LESS SUITABLE.

US ARMY

SUMMARY RESPONSE TO EEAs (CONT.)

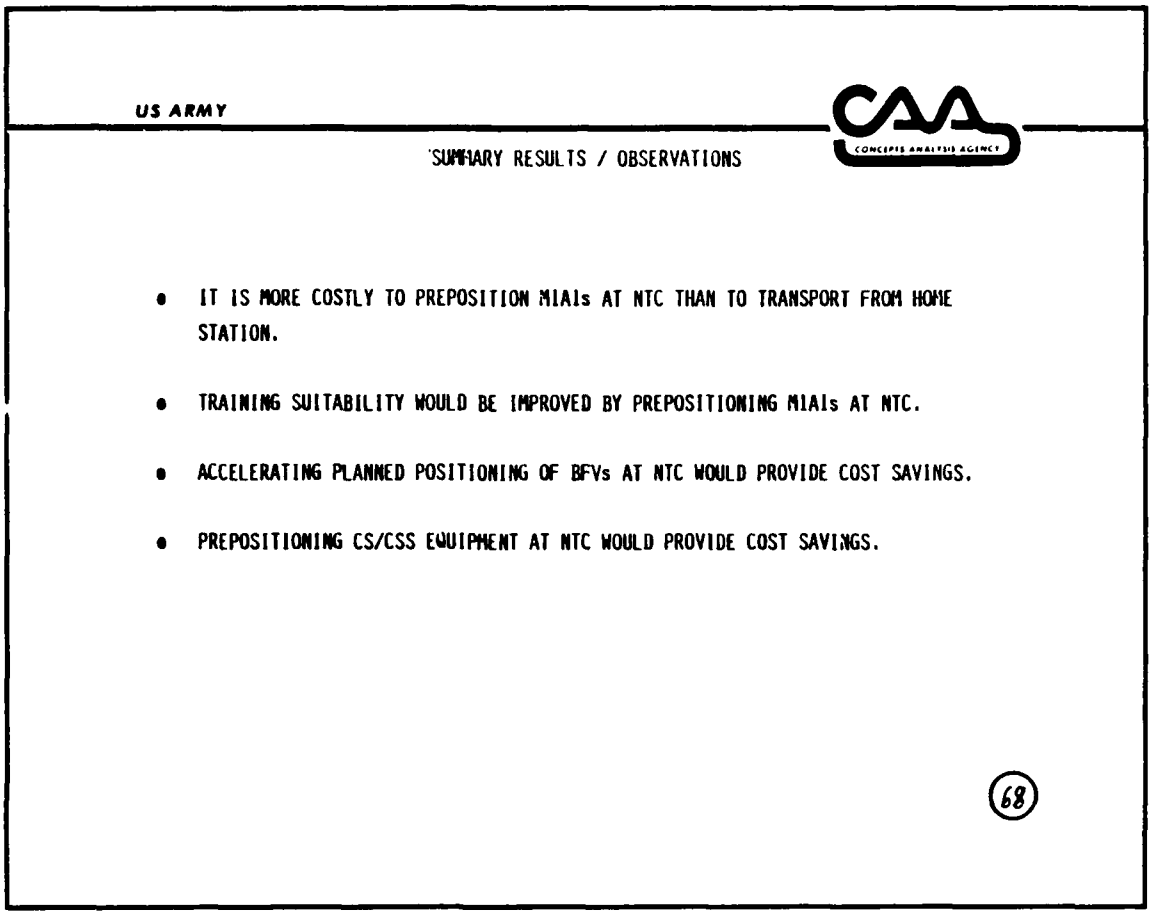
- WHAT ARE THE COST IMPLICATIONS FOR THE M1A1 TANK USING THE 120MM AMMUNITION OR OTHER TRAINING AMMO/DEVICES FOR LIVE FIRING AS COMPARED TO THE M1 TANK WHICH USES THE 105MM AMMUNITION?

  THE 105MM AMMO IS RETROGRADE AMMO. AMMO COSTS WOULD BE $38 MILLION OVER THE PERIOD FY 88 TO 91 IF M1A1s ARE PREPOSITIONED. COMPARED TO $4.7 MILLION IF THEY ARE NOT. AMMO COSTS ARE REDUCED TO $3.6 MILLION IF M1A1s ARE PREPOSITIONED WITH THE 35MM AMMO DEVICE.

- WHAT ARE THE COST IMPLICATIONS OF PREPOSITIONING CS/CSS EQUIPMENT AT NTC vs TRANSPORTING FROM HOME STATIONS?

  COST SAVINGS OF $17 MILLION TO $49 MILLION CAN BE REALIZED FY 88 TO 91 BY PREPOSITIONING CS/CSS EQUIPMENT AT THE NTC.

(67)



Key results of the study are shown in Chart 68. They are based on proposed changes to current or planned FORSCOM/NTC operations.

APPENDIX A

STUDY CONTRIBUTORS

1. STUDY TEAM

a. Study Director

Mr. Kenneth R. Simmons, Force Systems Directorate

b. Team Members

MAJ(P) Richard D. Martin
Mr. Joel S. Gordon

2. PRODUCT REVIEW BOARD

LTC Thomas C. Wegleitner
Mr. Ronald B. Bonniwell
Ms. Ola C. Berry
Mr. Stephen Cooke

APPENDIX B

STUDY DIRECTIVE

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, DC 20310 - 04

REPLY TO ATTENTION OF
DAMO-TRS

16 DEC 1986

SUBJECT: National Training Center Prepositioned Equipment Study

Director
U.S. Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, MD 20814-2797

1. **PURPOSE OF STUDY.** This directive provides for the conduct of a "quick response" study to evaluate possible cost savings and training benefits realizable by varying the type and quantity of prepositioned fighting vehicles and by prepositioning CS/CSS equipment at the National Training Center (NTC).

2. **STUDY TITLE.** National Training Center Prepositioned Equipment Study (NTCPE).

3. **BACKGROUND.** During the National Training Center Functional Area Assessment, 4 June 1986, Vice Chief of Staff, Army requested an analysis of the issue of the "best mix" of equipment for the prepositioned equipment pool at the National Training Center (NTC). Currently, units in training transport equipment from their home station to augment the NTC equipment pool. Cost savings may be realized and training may be enhanced by determining the proper mix of prepositioned equipment at the NTC.

4. **STUDY PROPONENT.** HQDA, Office of the Deputy Chief of Staff for Operations (ODCSOPS), is the study proponent. Chief, Training Support Division (DAMO-TR), COL Harry J. Bacas is the proponent's study sponsor. LTC James N. Lieteau and MAJ Kurt D. Norman are the study sponsor's coordinating points of contact.

5. **STUDY AGENCY.** U.S. Army Concepts Analysis Agency (CAA).

6. **TERMS OF REFERENCE.**

a. Statement of Problem. Currently, units scheduled for training at the NTC transport equipment to the NTC to augment the NTC equipment pool. It is unknown if cost savings could be realized by prepositioning additional combat equipment (tanks and BFV) at the NTC. There is a need to determine the proper mix of these vehicles while considering, to the extent possible, the dual objectives of maximizing training benefits and minimizing costs.

DAMO-TRS 16 DEC 1986
SUBJECT: National Training Center Prepositioned Equipment Study

b. Purpose. Conduct a study to determine if it is less costly to preposition vehicles (tanks and BFV) at the NTC or to transport vehicles from home station. The study will address the equipment mix to maximize training benefits for the using units and, to the extent possible, reduce costs. Consideration will be given to training schedules, type of vehicles the units would employ in wartime, number of additional fleets that may be required at the NTC, increased NTC maintenance requirements, and types of tank ammunition to be used in training. An analysis of prepositioning CS/CSS equipment (vehicles) will be conducted in Phase 2 of the study.

c. Scope. Combat vehicles to be reviewed in the study are the M60A3, M1 and M1A1 tanks and M2/M3 fighting vehicles. Rotation schedules will be reviewed to determine if cost savings can be realized through revision. The study will also consider NTC operations as envisioned in the proposed NTC "Concept 1996" briefing for the CSA/SA. Phase 2 will address CS/CSS equipment with respect to cost savings of transporting vice prepositioning.

d. Objectives. Determine the potential cost savings and training benefits that would be achieved by prepositioning equipment at the NTC. Determine the best schedule for and the quantities of equipment to be prepositioned to achieve the potential cost savings. Also review training schedules and/or possible changes in Army Policy to minimize costs.

e. Timeframe. Current through FY 1991.

f. Assumptions.

(1) Operations and support costs for fighting vehicles used at the NTC during training will not impact on cost analysis.

(2) The rate of ammunition usage per battalion and ammunition cost per round will not change during the study timeframe.

(3) FORSCOM and ARNG Modernization Plans will be generally executed as currently planned.

(4) Equipment planned for use in war (e.g. M1A1) will not change during study timeframe.

(5) Training schedule for FY 87 is assumed fixed. Some limited adjustment to the FY 88 schedule may be possible.

(6) Based on ODCSOPS guidance, the hierarchy of relative unit training benefit categories is assumed to be as follows:

DAMO-TRS 16 DEC 1986
SUBJECT: National Training Center Prepositioned Equipment Study

(a) Unit trains at the NTC on equipment that it will fight with, which is the same as equipment at home station -- Most Desirable.

(b) Unit trains on equipment at the NTC that it will fight with, but equipment at home station is different, e.g. M1A1 at NTC and wartime, M1 at home station -- Desirable.

(c) Unit trains on same equipment at NTC that it has at home station, however it will fight with different equipment, e.g. trains on M1 at NTC and home station, but M1A1 in wartime -- Less Desirable.

(7) Current training policy will remain in effect which prescribes that units assigned modernized equipment at home station will not train on nonmodernized equipment at the NTC.

g. Limitations.

(1) Combat support and combat service support equipment costs are not considered in Phase 1 of this study but will be considered in Phase 2.

(2) MCA costs will be considered but not included in the analysis due to 7-year lag in funding.

(3) Only major cost elements will be addressed. Minor cost elements may be included in a qualitative analysis.

(4) Only vehicles will be considered in the analysis.

(5) Training effectiveness during actual training will not be assessed.

h. Essential Elements of Analysis (EEA).

(1) Is it less costly to preposition M1A1 tanks and BFV at the NTC or to transport from home station?

(2) If less costly to prepostion, what is the proper mix and time to preposition M1A1 and BFV at the NTC based on possible cost savings?

(3) When should the M1A1 tanks and BFVs be available at NTC to maximize training benefits, i.e., given that units training with M1 or M1A1 tanks should be operating with M2/M3 BFV?

(4) What are the training benefits? Benefits are to be assessed by determining the number of units per year training in

various qualitative training categories, e.g. maximum benefit is achieved by unit possessing and training with same type of equipment it is designated to use in wartime.

(5) What are the cost implications for using 120mm ammunition or other training ammo/devices for live firing in comparison to using 105mm ammunition?

(6) What qualitative implications were determined during the course of the study?

7. **RESPONSIBILITIES.**

a. The study proponent, ODCSOPS, will:

(1) Provide a study coordinator.

(2) Schedule in-process reviews (IPR).

(3) Task various agencies for data as requirements become known.

(4) Provide supplemental funds for travel to the NTC and FORSCOM units. Local and nearby travel funds will be provided by CAA.

(5) Provide data and data sources. Suggest alternatives to be considered.

(6) Authorize direct contact with various governmental agencies.

b. The study agency, CAA, will:

(1) Designate a study director and establish a full-time study team.

(2) Establish direct communications with governmental agencies as required for the conduct of the study.

(3) Provide an IPR and annotated briefing slides as final study documentation to the study proponent. The final product will include a cost summary by year for all unit rotations. Training benefits will be categorized as most desirable, desirable, or less desirable.

DAMO-TRS 16 DEC 1986
SUBJECT: National Training Center Prepositioned Equipment Study

(4) Provide programing and ADP support as required for the conduct of the study.

8. **LITERATURE SEARCH.**

a. A Defense Technical Information Center (DTIC) search will be conducted.

b. NTC lessons Learned reports from Unit Commanders will be reviewed.

9. **REFERENCES.**

a. DA Pamphlet 5-25, Army Modernizations Information Memorandum (AMIM).

b. AR 5-5.

c. AR 10-38.

d. Others TBD.

10. **ADMINISTRATION.**

a. Support-Funding for temporary duty (TDY) and local travel associated with the study will be provided by each participating agency except as noted in paragraph 7a.(4).

b. Milestone schedule.

Event	Date
Develop Study Directive	On-going
Request Data	On-going
Receive data from ODCSOPS	12 Nov 86
Brief Study Proponent on Phase 1	5 Dec 86
Complete Phase 1	19 Dec 86
Brief Study Proponent on Phase 2	15 Feb 87
Complete CAA study	28 Feb 87

11. **COORDINATION.** This directive has been coordinated with CAA in accordance with AR 10-38.

FOR THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS:

James B. Allen Jr.

JAMES B. ALLEN, JR.
Major General, GS
Director of Training

DAMO-TRS 16 DEC 1986
SUBJECT: National Training Center Prepositioned Equipment Study

CF:
HQDA, ATTN: DACS-DMO, Washington, D.C. 20310-0450
Commander, US Army Materiel Command, ATTN: AMCRE, Alexandria, VA 22333-0001
Commander, US Army Training and Doctrine Command, ATTN: ATTG, Fort Monroe, VA 23651-5000
Commander, US Army Forces Command, ATTN: AFOP, Fort McPherson, GA 30330-5000

APPENDIX C

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APPENDIX D

NTC OPERATIONS

D-1. INTRODUCTION. This appendix contains a detailed description of operations at NTC. The description was published in a Rand Corporation report dated June 1986.* The description is repeated here since it provides a good picture of NTC operations and, for the most part, will still be applicable when operations are expanded in the future from two battalions to three battalions.

D-2. ROTATIONS. An NTC training rotation consists of the deployment to Fort Irwin for 14-18 days of force-on-force engagements (and separate live-fire exercises, which are not covered here) of two battalions, generally one mechanized infantry and one tank, from a FORSCOM heavy division or separate brigade. In addition, the division sends in a brigade slice of assets, including the brigade headquarters, a forward support battalion, elements of the division artillery, an appropriate share of the division air assets, and combat engineering support. On occasion, a cavalry squadron will substitute for one battalion, or the heavy forces may be supplemented by a light infantry battalion. Close air support is provided by the US Air Force during battle engagements.

D-3. OPPOSING FORCE (OPFOR). The FORSCOM Blue Forces (BLUFOR) are trained against a standing Opposing Force (OPFOR), which consists of two US heavy battalions, one infantry and one tank. The infantry battalion lacks most of its dismounted element, which is often provided by other US infantry units. The two battalions are configured for battle as a motorized rifle regiment of the "Krasnovian" forces, and replicate a Soviet-supplied Warsaw Pact unit. For the most part, their vehicles are US equipment visually modified to resemble Soviet T-72 tanks, personnel carriers, etc. Their battle doctrine is that attributed to Warsaw Pact forces.

D-4. OBSERVER/CONTROLLERS (OC). The training is conducted by teams of observer/controllers (OC), who are US Army officers and NCOs on regular assignment to the NTC. A team of about 30 or more is assigned to each training battalion, and accompanies the BLUFOR throughout their rotation. The team's function is to control the battle, assess results, and provide an After Action Review at the conclusion of each engagement.

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*Levine, Robert A., James S. Hodges, and Martin Goldsmith: Utilizing the Data from the Army's National Training Center: Analytical Plans, Rand Corporation (9N-2461-A), June 1986.

D-5. CORE INSTRUMENTATION SUBSYSTEM (CIS). The conduct of the training is assisted by the Core Instrumentation Subsystem (CIS), a notable feature of the NTC. The training area at Fort Irwin, which consists of a large expanse (over 600,000 acres) of the California high desert, incorporates a series of radio position/location (p/l) stations. These stations communicate with p/l units installed on BLUFOR and OPFOR combat vehicles, and carried by some dismounted infantry units and some observer/controller vehicles. By triangulation, the position of each vehicle can be determined by the CIS, which provides data to a central Training Analysis and Feedback (TAF) facility near the Fort Irwin post headquarters. This information is displayed at a TAF operations center on graphics terminals where the operational information is superimposed on map displays of the training area with a choice of scales and cartographic backgrounds. These displays can also show overlay graphics prepared for the battles as part of the planning and orders process. Thus an analyst stationed at one of the terminals may observe the position of the engaged units during the battle, and moreover can replay prior action at any time during or after the battle.

D-6. MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES)

a. Simulation. In the force-on-force exercises at the NTC, MILES is used to simulate weapon engagement. Each direct-fire weapon system (i.e., a system aimed along a line of sight to a target, as compared to artillery fired on a high trajectory) is equipped with an eye-safe laser boresighted to the weapon. When the weapon is fired (with blank ammunition or a simulator), a coded laser beam is emitted. Each individual player and each tactical vehicle is equipped with laser receivers which register hits by the laser designators. If a soldier is hit by an M16 rifle code, his MILES set will register the hit with a piercing audio tone, which will indicate to all that he is a casualty. On the other hand, if a tank registers a hit by an M16 code, nothing happens, because a rifle cannot kill a tank.

b. Tanks. When a tank main gun fires, several things take place. The coded laser beam is directed at the target, a simulator charge is fired that yields a visible and audible signal, and a firing message is sent through the p/l unit to the CIS. Should the laser beam hit a target vehicle squarely (kill probabilities can be accounted for), the target's instruments will register the code of the weapon type, disable its firing mechanism if it is a tank, start an externally mounted strobe light, and send a kill signal to the CIS. The CIS, on receiving such a signal, will search for a firing message to match in character and time; when one is found, a pairing is made. (Frequently, however, a pairing cannot be made owing to signal masking or other instrumentation problems.) The graphic display will then show a firing vector between the units, and a kill, if that is the result of the hit. The instrumentation system keeps a record of the near misses, hits, and kills, shows the locations of the firer and target, calculates the range, and keeps cumulative scores.

c. Deficiences. A deficiency of the system is that firing of infantry weapons, such as rifles, Vipers, or dismounted TOWs, is not

recorded, and therefore paired kills from such sources cannot be seen; the kill will simply be recorded as of unknown origin (although the original field data stream contains the killing weapon type). Moreover, MILES cannot be used with indirect-fire systems, so the simulation of artillery and mortars still involves subjective assessments. At the present time, the helicopters are equipped with MILES, but are not linked into the CIS. Fixed wing aircraft are not equipped with instrumentation, and close air support and air defense are played in a subjective fashion. Thus the CIS battle record is of great value, but is by no means complete.

D-7. BATTLE SCENARIO. When a unit arrives at the NTC, its command group is issued orders from a fictional division headquarters which establishes the upcoming mission and lays out the situation in terms of neighboring friendly forces (notional) and the OPFOR. The scenario usually involves a Krasnovian invasion of a US ally, Mojave. The task force command groups then begin their deployment to initial positions, and prepare operations orders. As the battles progress, new situational information is issued by the divisional headquarters (actually a section of the NTC Operations Group). As each battle is terminated by the Operations Group, the task forces must undertake the problems of real-world repairs and resupply, plus such simulated efforts as evacuation, reconstitution, and ammunition resupply, all of which must be accomplished in real time by real assets.

D-8. FEEDBACK. Throughout their time at the NTC, the training units are closely observed by the controller teams. At the conclusion of each battle, the company and platoon level observers conduct After Action Reviews (AAR) in the field. The battalion level AAR occurs a few hours after the battle, and involves the battalion staff and commanders. This review is limited to 2 hours, and takes place in a mobile TV van located near the battle area. Equipment in the van is capable of displaying the CIS graphics, which help illustrate important points about the day's action. The interactive AAR process is videotaped for future use by the training unit. This tape, and written summaries of the notes made in the field by the observer/controllers are part of a take-home package supplied to the unit at the end of its rotation.

APPENDIX E

PHASE I COSTS

E-1. INTRODUCTION. This appendix provides the detailed cost computations to support the costs summarized in Phase I of the study.

E-2. AMMUNITION COSTS

a. Table E-1 displays the cost estimate for tank ammunition per rotation. Ammunition costs were calculated for both the 105mm and 120mm rounds. Currently, zero costs are assumed for the 105mm retrograde war reserve ammo. The cost per rotation for the 120mm ammunition is $1.596 million.

Table E-1. Cost of Tank Ammunition per Rotation ($FY 87)

Ammo type[a]	Cost/ round	Rounds/ rotation	Cost of tank ammo/rotation	
			105mm	120mm
C505	$505.00	1,906	$962,530	NA
C511	$135.69	174	23,610	NA
C520	$151.82	414	62,858	NA
Subtotal		2,494	$1,048,998	NA
C785	$604.58	2,320		$1,402,626
C784	$1,108.57	174		192,891
Subtotal		2,494		$1,595,517

[a]Small quantities of other types excluded.

b. Costs were computed for the period FY 88-91 as shown in Table E-2. Costs for 105mm ammunition were not used in the study because an adequate supply of 105mm ammunition from displaced war reserve stocks (retrograde ammunition) are expected to be available over the timeframe of the study. Thus, the ammunition costs reflecting costs for the 120mm ammunition, is $38.292 million.

Table E-2. Cost of Tank Ammunition, FY 88-91 ($FY 87) (000)

Year/ ammo type	Rotations		Total cost per year (000)
	Number/year	Cost/rotation (000)	
FY 88			
105mm	13	0	0
120mm	1	$1,595.5	$1,596
FY 89			
105mm	9	0	0
120mm	5	$1,595.5	7,977
FY 90			
105mm	6	0	0
120mm	8	$1,595.5	12,764
FY 91			
105mm	4	0	
120mm	10	$1,595.5	15,955
Total FY 88-91			$38,292

E-3. CONTRACTOR MAINTENANCE COSTS FOR M1A1 TANKS. The cost to maintain a fleet of 68 M1A1 tanks was estimated by the contractor at $598,000. This estimate was based on a requirement for 26 technicians at $23,000 per year. However, since the first fleet of M1A1s would coincide with the transfer of the M60A1 tanks to a sustainment maintenance mode, the requirement would be reduced to 11 technical personnel and would save $253,000 per year. Thus, the annual maintenance costs for the first fleet of M1A1 tanks would amount to $345,000 per year ($598,000 - $253,000) for FY 89-91 or $1,035,000. The second fleet of M1A1s would cost the full $598,000 per year to maintain when arriving in FY 90 or $1,196,000 for FY 90-91. Thus, the total cost for both M1A1 fleets for FY 88-91 is $2,231,000 ($1,035,000 + $1,196,000).

E-4. CONTRACTOR MAINTENANCE COSTS FOR BFVs. A total of 10 technical and support personnel at $23,000 per year was estimated to support a fleet of prepositioned BFVs at the NTC. In addition, 26 master tool kits at a cost of approximately $550 each would be required the first year to support the BFVs. Thus, contractor costs for the BFVs would be $244,300 ($230,000 + $14,300) for the first year (FY 88) and $230,000 for the subsequent 3 years. Since the BFV fleet is scheduled to be received at the end of FY 91 and would not be usable until FY 92, a recurring cost was calculated to include FY 91. Fielding costs were not included because they would be incurred even if the BFVs are fielded as scheduled.

E-5. COST OF 35MM AMMUNITION DEVICE AND 35MM AMMUNITION. The cost of the 35mm ammunition device currently being tested by the US Army Test and Evaluation Command (TECOM) at Aberdeen Proving Grounds was estimated at $100,000 per device by Office of The Project Manager for Training Devices (PM TRADE) or $5,800,000 for a fleet of 58 M1A1 tanks. The cost used for 35mm training rounds was $61 per round, which is the price currently charged to the Army by Safeco Defense Industries. The 24 rotations that would fall in on M1A1 tanks (shown in third column of Table E-4) would use 2,494 rounds per rotation (Table E-1)) at $61 per round costing $3,651,216.

E-6. COST TO TRANSPORT M1A1 TANKS FROM FT BLISS (3ACR) to NTC. The cost to transport a fleet (58) of M1A1 tanks to NTC and return was calculated as follows. The fleet of 58 tanks was loaded at the rate of two per railcar, requiring 29 railcars. The cost of 29 railcars at $6,000 per railcar is $174,000. Loading and unloading costs at $43.24* per railcar is $1,254 and commercial transportation costs were estimated to be $2,472.** The total transportation cost per rotation for the 3ACR is $177,726.

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*The load/unload cost of $43.24 per rail car was the amount charged for loading and unloading tanks at the railhead by the Marine logistics unit.

**Commercial transportation costs amounted to $34,609 in FY 86, or an estimated cost of $2,472 per rotation.

E-7. ROTATION SCHEDULE. The 3 ACR is scheduled to go to the NTC three times during the FY 88-91 timeframe as shown in Table E-3.

Table E-3. Rotation Schedule

88-01	3 ACR	90-01	1CD
88-02	5ID	90-02	1ID
88-03	1ID	90-03	4ID
88-04	24ID	90-04	5ID
88-05	5ID	90-05	24ID
88-06	1ID	90-06	1ID
88-07	4ID	90-07	24ID
88-08	2AD	90-08	1CD
88-09	1CD	90-09	194BDE
88-10	194AB	90-10	2AD
88-11	1CD	90-11	4ID
88-12	24ID	90-12	5ID
88-13	4ID	90-13	197BDE
88-14	2AD	90-14	4ID
89-01	5ID	91-01	1ID
89-02	4ID	91-02	197BDE
89-03	1CD	91-03	5ID
89-04	24ID	91-04	4ID
89-05	1ID	91-05	2AD
89-06	197EB	91-06	194BDE
89-07	1ID	91-07	1CD
89-08	5ID	91-08	1ID
89-09	3ACR	91-09	4ID
89-10	2AD	91-10	24ID
89-11	1CD	91-11	3ACR
89-12	24ID	91-12	2AD
89-13	4ID	91-13	24ID
89-14	2AD	91-14	1CD

E-8. BFV TRANSPORT COSTS. The following rail costs were computed for units scheduled to possess BFVs in FY 88-91 based on the schedule shown in Table E-4.

FY	Rail costs	Other transport costs*	Total ($FY87)
88	$1,062,247	$8,094	$1,070,341
89	$1,707,021	$11,813	$1,718,834
90	$1,896,002	$12,440	$1,908,442
91	$2,509,251	$16,158	$2,525,409
	Total		$7,223,026

*These costs include load/unload costs which were $43.24 per railcar. The total number of BFVs is shown in Table E-4. There are two BFVs per rail car. In addition to load/unload costs, a cost of $2,300 per year was added to account for transport costs to and from the railhead to the NTC.

Table E-4. BFV Transportation Costs

ROTATION	UNIT	TANK TYPE	IF M1A1 PREPOS	NUMBER TANKS	NUMBER IFV M2	NUMBER IFV M3	ACTUAL IFV (M2/3) SHIPPING COSTS	FY87 C$	PROJECTED IFV (M2/3) SHIPPING COSTS	CATEGORIES & CA1 NON-PREPOSITIONED TANKS	CA1 NON-PREPOSITIONED IFV	CA2 PREPOSITIONED TANKS	CA2 PREPOSITIONED IFV	INCLUSIVE DATES	HOME STATION	NON-POMCUS
88-01	3ACR	M1A1	M1A1	58	0	0	$0	$0	$0	A	A	A	A	12 OCT - 31 OCT	H	H1	8
88-02	5ID	M60A1	M60A1	58	0	0	$0	$0	$0	C	A	C	A	5 NOV - 24 NOV	C	C1	
88-03	1ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	29 NOV - 18 DEC	D	D1	
88-04	24ID	M1	M1	58	0	0	$0	$0	$0	A	A	A	A	8 JAN - 27 JAN	I	I1	8
88-05	5ID	M60A1	M60A1	58	0	0	$0	$0	$0	C	A	C	A	1 FEB - 20 FEB	C	C1	
88-06	1ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	25 FEB - 15 MAR	D	D1	
88-07	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	28 MAR - 8 APR	E	E1	
88-08	2AD	M1	M1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	13 APR - 2 MAY	B	B1	
88-09	1CD	M1	M1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	7 MAY - 26 MAY	A	A1	
88-10	194AB	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	31 MAY - 19 JUN	F	F1	
88-11	1CD	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	7 JUL - 26 JUL	A	A1	
88-12	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	31 JUL - 19 AUG	I	I1	8
88-13	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	26 AUG - 8 SEP	E	E1	
88-14	2AD	M1	M1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	17 SEP - 6 OCT	B	B1	
	PROJECTED BFV SHIPPING COST FY 88						$1,020,410	$1,062,247	$1,416,084								
89-01	5ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	11 OCT - 30 OCT	C	C1	
89-02	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	4 NOV - 23 NOV	E	E1	
89-03	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	28 NOV - 17 DEC	A	A1	
89-04	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	7 JAN - 26 JAN	I	I1	8
89-05	1ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	31 JAN - 19 FEB	D	D1	
89-06	197IB	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	24 FEB - 14 MAR	G	G1	
89-07	1ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	19 MAR - 7 APR	D	D1	
89-08	5ID	M1	M1	58	0	0	$0	$0	$0	C	A	B	A	12 APR - 1 MAY	C	C1	
89-09	3ACR	M1A1	M1A1	58	0	38	$109,510	$114,000	$128,330	A	A	A	A	6 MAY - 25 MAY	H	H1	8
89-10	2AD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	30 MAY - 18 JUN	B	B1	
89-11	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	10 JUL - 29 JUL	A	A1	
89-12	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	3 AUG - 22 AUG	I	I1	8
89-13	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	27 AUG - 15 SEP	E	E1	
89-14	2AD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	20 SEP - 9 OCT	B	B1	
	PROJECTED BFV SHIPPING COST FY 89						$1,539,790	$1,707,021	$2,410,210								
90-01	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	8 OCT - 31 OCT	A	A1	
90-02	1ID	M1	M1A1	58	54	13	$273,159	$284,359	$275,144	C	A	B	A	5 NOV - 24 NOV	D	D1	
90-03	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	3 DEC - 19 DEC	E	E1	
90-04	5ID	M1	M1A1	58	0	0	$0	$0	$0	C	A	B	A	4 JAN - 27 JAN	C	C1	
90-05	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	2 FEB - 25 FEB	I	I1	8
90-06	1ID	M1	M1A1	58	54	13	$273,159	$284,359	$275,144	C	A	B	A	1 MAR - 20 MAR	D	D1	
90-07	24ID	M1	M1A1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	24 MAR - 16 APR	I	I1	8
90-08	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	21 APR - 10 MAY	A	A1	
90-09	194BDE	M1	M1	58	0	0	$0	$0	$0	A	A	A	A	14 MAY - 2 JUN	F	F1	
90-10	2AD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	5 JUN - 29 JUN	B	B1	
90-11	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	4 JUL - 23 JUL	E	E1	
90-12	5ID	M1	M1A1	58	0	0	$0	$0	$0	C	A	B	A	31 JUL - 19 AUG	C	C1	
90-13	197BDE	M1	M1	58	0	0	$0	$0	$0	A	A	A	A	23 AUG - 15 SEP	G	G1	
90-14	4ID	M60A3	M60A3	58	0	0	$0	$0	$0	A	A	A	A	20 SEP - 9 OCT	E	E1	
	PROJECTED BFV SHIPPING COST FY 90						$1,821,320	$1,896,002	$2,557,023								
91-01	1ID	M1	M1A1	58	54	13	$273,159	$284,359	$275,144	C	A	B	A	8 OCT - 31 OCT	D	D1	
91-02	197BDE	M1	M1	58	0	0	$0	$0	$0	A	A	A	A	5 NOV - 24 NOV	G	G1	
91-03	5ID	M1	M1A1	58	54	13	$224,316	$233,513	$308,639	C	A	B	A	3 DEC - 19 DEC	C	C1	
91-04	4ID	M1	M1A1	58	0	0	$0	$0	$0	C	A	B	A	4 JAN - 27 JAN	E	E1	
91-05	2AD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	2 FEB - 25 FEB	B	B1	
91-06	194BDE	M1	M1	58	0	0	$0	$0	$0	A	A	A	A	1 MAR - 20 MAR	F	F1	
91-07	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	24 MAR - 16 APR	A	A1	
91-08	1ID	M1	M1A1	58	54	13	$273,159	$284,359	$275,144	C	A	B	A	21 APR - 10 MAY	D	D1	
91-09	4ID	M1	M1A1	58	0	0	$0	$0	$0	C	A	B	A	14 MAY - 2 JUN	E	E1	
91-10	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	6 JUN - 29 JUN	I	I1	8
91-11	3ACR	M1A1	M1A1	58	0	38	$109,510	$114,000	$128,330	A	A	A	A	4 JUL - 23 JUL	H	H1	8
91-12	2AD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	31 JUL - 19 AUG	B	B1	
91-13	24ID	M1	M1	58	54	13	$254,600	$265,039	$590,652	A	A	A	A	23 AUG - 15 SEP	I	I1	8
91-14	1CD	M1	M1A1	58	54	13	$255,270	$265,736	$275,144	C	A	B	A	20 SEP - 9 OCT	A	A1	
	PROJECTED BFV SHIPPING COST FY 91						$2,410,424	$2,509,251	$3,243,134								

E-9. TRAINING AIDS. Training aids costs were extracted from the 1986 M1A1 POMCUS Sustainment Study completed by USAARMC, as shown in Table E-5.

Table E-5. Training Aids

Training aid	Cost per div/sep bde	# Tng aids rqrd	Tng aid cost ($FY 86)
a. Breechblock	$39,000	7[a]	$273,000
b. Ammo compartment**	30,000	7[a]	210,000
c. NBC system	38,000	8	304,000
d. Interactive videos for tankers			160,000
e. Television tapes for mechanics			264,000
Subtotal x FY 87 inflation factor (1.039)			$1,211,000
Total $FY 87			$1,258,229

[a]One training aid is required for each division/separate brigade.

[b]Thirty rounds of SABOT and 30 rounds of HEAT are needed for each division/separate brigade (7 in all) at a total cost of $23,000. Dummy ammo is designed to last 5 years.

APPENDIX F

PHASE II COSTS

F-1. INTRODUCTION. This appendix provides supporting documentation for the cost estimates contained in Phase II of the study. Included are the calculations for railcars, selection of equipment to be pre-positioned, and cost calculations.

F-2. RAILCAR CALCULATION. Table F-1 displays a list of vehicles and the corresponding number of 90-foot railcars required for transport. This list, provided by Headquarters, 1st Cavalry Division, Fort Hood,* with minor CAA modifications to headings, was used to compute railcar requirements for vehicles that were considered for prepositioning at the NTC. Railcar requirements for vehicles that were not on this list were determined by vehicle length according to the following equations. This data was considered typical and was used for computational purposes.

	Vehicle length "X"	Number of vehicles per railcar
a.	100" ≤ X ≤ 190"	5 vehicles
	191" ≤ X ≤ 250"	3 vehicles
	251" ≤ X ≤ 480"	2 vehicles
	481" ≤ X ≤ 1080"	1 vehicle

b. The exceptions to these equations are:

MLRS	1 vehicle/railcar
M151	10 vehicle/special railcar
¼-Ton trailer	9 trailers/railcar
Other trailers	7 trailers/railcar
M35 (2½-ton truck)	3 vehicles/railcar

F-3. RAILCAR COSTS. An average round trip cost per railcar of $[illegible] was computed by applying the average cost per railcar and average number of railcars for each unit to the 4-year rotation schedule shown in Table E-2, Appendix E. The total estimated railcar cost was [illegible] by the total estimated number of railcars to obtain an average [illegible] railcar. This cost was used to calculate potential railcar [illegible] savings for the Phase II alternatives.

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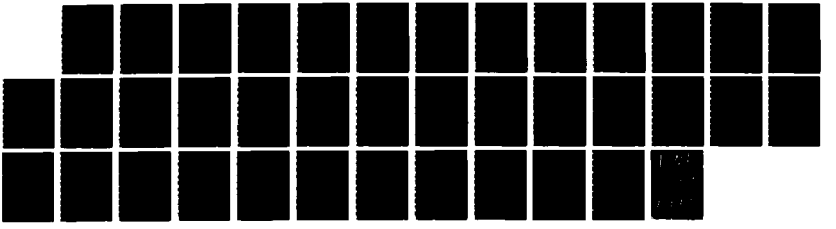
*1st BDE Task Organization for [illegible] Rotation [illegible] Headquarters, 1st Cavalry Division, [illegible]

AD-A184 811 NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT 2/2
(NTCPE) STUDY(U) ARMY CONCEPTS ANALYSIS AGENCY BETHESDA
MD K R SIMMONS JUL 87 CAA-SR-87-16

UNCLASSIFIED F/G 5/3 NL



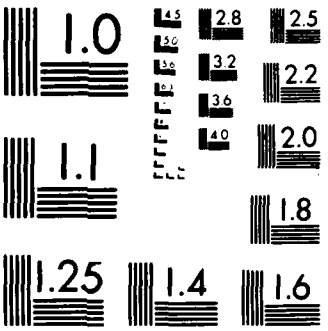


Table F-1. Calculation of Railcar Requirements for 1st BDE NTL Rotation 87-5

VEHICLE TYPE	QUANTITY	DESCRIPTION	DIMENSIONS (LxWxH) INCHES	RAILCAR
M993	3	MLRS		3
M2	54	INFANTRY FIGHTING VEHICLE	258x126x116	27
M3	33	CAVALRY FIGHTING VEHICLE	258x126x117	16.5
M48	4	CHAPPARAL	241x106x108	1.33
M60	2	CARRIER, BRIDGE	340x144x110	1
M88	14	RECOVERY VEHICLE	323x144x134	7
M106	15	CARRIER, 107MM MORTAR	194x106x087	5
M109	18	HOWITZER, 155MM	260x148x121	9
M113	56	CARRIER, PERSONNEL	192x106x087	18.6
M163	4	VULCAN	192x113x113	1.33
M540	19	CARRIER, CARGO TRACKED	127x106x107	6.3
M577	28	CARRIER, COMMAND POST	194x106x106	9.3
M578	4	RECOVERY VEHICLE	254x124x131	2.0
M4K	4	4000 LB FORKLIFT	206x079x080	1.33
M10A	1	10000 LB FORKLIFT	343x101x131	0.5
MW24	2	SCOOPLOADER	283x102x130	1.0
D7F	3	BULLDOZER	298x133x125	1.5
D8	4	BULLDOZER	321x156x135	2
JD410	1	BACKHOE	284x090x141	.5
M101/M116	19	TRAILER, 3/4T	147x074x083	2.7
M105	129	TRAILER, 1 1/2T	167x083x050	18.4
M127	6	SEMITRAILER, 40T	345x097x109	3
M129	2	SEMITRAILER, VAN 12T	352x097x144	1
M51	3	TRUCK, DUMP 5T	275x099x111	1.5
M52	30	TRUCK, TRACTOR 5T	274x095x111	1.5
M109	15	TRUCK, VAN 5T	282x096x129	7.5
M172	3	SEMITRAILER, 25T	411x116x068	1.5
M275	1	TRUCK, TRACTOR 2 1/2T	228x093x081	0.33
M543	6	TRUCK, WRECKER 5T	350x095x085	3
M813	18	TRUCK CGO 5T	302x115x116	9
M313	1	VAN, 5T EXPANDO	323x096x134	.5
M967	5	STLR, TANK FUEL	368x098x104	.7
M816	2	TRUCK, WRECKER 5T	357x095x106	.5
M817	3	TRUCK, DUMP 5T	289x098x112	1.5
M818	21	TRUCK, TRACTOR 5T	280x098x116	10.5
M819	1	TRUCK, WRECKER 5T	360x098x132	.5
M916	3	TRUCK, TRACTOR	295x096x142	1.5
M920	5	TRUCK, TRACTOR	319x096x142	2.5
M923	36	TRUCK, CARGO 5T	327x093x116	18
M925	10	TRUCK, CARGO 5T	342x098x116	3.33
M936	5	TRUCK, WRECKER 5T	363x098x112	2.5
M977	31	HEMMT, CARGO	401x096x112	15.5
M978	19	HEMMT, FUELER	401x096x112	9.5
M131	13	TRAILER, TANK 5000 GAL	374x097x108	6.5
M149	32	TRAILER, WATER	160x081x071	4.6
M416	127	TRAILER, 1/4T	109x061x044	19.1
M569	2	TRAILER, 3KW GENERATOR	147x074x083	4.4
M750	4	SEMITRAILER, VAN	323x095x132	4.4
M871	25	SEMITRAILER 22 1/2T	358x096x103	4.4
ELT9T	2	LAUNDRY UNIT TRLR MTD	198x098x097	.6
MPQ19	1	RADAR, VEHICLE MOUNTED	192x115x120	.33
M151	152	TRUCK, UTILITY 1/4T	133x065x053	15.2
M1008	46	TRUCK, CARGO 5/4T	221x082x076	15.3
M1009	53	TRUCK, TACTICAL 3/4T	192x080x075	10.6
M1010	2	TRUCK, AMBULANCE TACTICAL	228x082x102	.66
M1028	18	TRUCK, TACTICAL 5/4T	221x082x108	6
M880	3	TRUCK, UTILITY 5/4T	219x080x074	1
M882	2	TRUCK, UTILITY 5/4T	219x080x074	1
M885	1	TRUCK, UTILITY 5/4T	219x080x074	1
M886	5	TRUCK, UTILITY 5/4T	219x080x074	1
M887	3	TRUCK, UTILITY 5/4T	219x080x074	2.7
M561	14	GAMMA GOAT	227x084x065	0
M792	1	TRUCK, AMBULANCE 5/4T	227x084x065	.3
M35	154	TRUCK, CARGO 2 1/2T	265x106x113	51.3
M985	4	HEMTT, CARGO	401x096x112	2
PU4	2	GEN, TRLR MTD	186x096x083	5.3
PU332	6	GEN, TRL MTD	147x076x083	5.3
PU650	5	GEN, TRLR MTD	190x097x088	5.3
PU619	3	GEN, TRLR MTD	175x085x098	5.3
PU620	11	GEN, TRLR MTD	147x074x074	5.3
PU62	10	GEN, TRLR MTD	147x077x083	5.3
MILVAN	15	MILVAN ON CHASSIS	242x096x149	5
M911	6	TRUCK, TRACTOR 8x8	370x115x142	3
M747	6	STLR, LOWBED 60T	515x137x114	6
M870	4	STLR, LOWBED 40T	510x120x070	4
M146	1	VAN, SHOP	276x096x129	.3
M128	1	STLR, VAN CARGO 12T	354x099x146	.5
M270	1	LOWBOY	600x098x124	1
M200	2	GEN, TRLR MTD	162x093x040	.3
ARFT6	1	TRUCK, LIFT 6000 LB	268x103x128	0.3
M927	1	TRUCK, CGO 5T XLWB	378x115x137	0.5
M55	1	TRUCK, CGO 5T XLWB	389x110x119	0.5
M969	1	STRL TANK 5000 GAL	368x096x105	0.5
PU617	1	GEN SET TRLR MTD	147x074x082	0.2
M51	2	SHELTER	168x085x096	0.4
M54	12	TRUCK CGO 5T LWB	297x110x118	4

F-4. EQUIPMENT SELECTION CRITERIA. Table F-2 is a list including a description of all vehicles considered for prepositioning (Alternative 4) in Phase II of the study. Vehicles that were selected for prepositioning were chosen by reviewing TOE and MTOE equipment recapitulations for modernized units participating in the brigade rotations and evaluating each piece of equipment as to the following criteria.

a. High Cube. Does this piece of equipment utilize a large amount of railcar space?

b. Quantity. Are there sufficient numbers of this item required such that prepositioning would significantly contribute to reduction in number of railcars required? Will the number prepositioned be of high enough density to facilitate maintenance?

c. Prime Mover. Wheeled and tracked vehicles were the primary candidates. Some vehicles were not considered viable candidates, such as command post carriers, expandovans, cargo vehicles, such as spare parts vans whose cargos were not easily palletized, and maintenance vehicles which may contain a large number of tools and/or calibration equipment.

d. Trailers. Cargo trailers were evaluated based on the ratio of total cube of trailer and cargo versus cargo cube. Cargo normally transported in trailers would be palletized or containerized for shipment if trailers were prepositioned which may not significantly reduce the number of railcars, but would increase the preparation time for shipment and deployment time once at the NTC.

F-5. COSTS FOR ALTERNATIVES 2, 3, AND 4. The costs for Alternatives 2, 3, and 4 were calculated by computing the reduction in railcars compared to the base case, computing savings in transportation costs due to this reduction, and adding the additional costs that would be incurred at NTC.

a. Railcar Reductions

(1) Alternative 2. The 84 tracked vehicles shown in Table F-2, if prepositioned, were calculated to save 56.5 railcars (50.8 railcars for required tracked vehicles plus 10 percent to account for the surplus of tracked vehicles currently provided by units).

Table F-2. Vehicles Candidates for Prepositioning at NTC

VEHICLE TYPE	LIN NUMBER	ITEM DESCRIPTION	NUMBER OF VEHICLES		
			TOE AUTH	NTC PREPOSITIONED	UNIT TRANSPORTED
M106	D10741	CARRIER 107MM MORTAR	12	0	12
M548	D11049	CARRIER CGO TRACKED 6TON	26	0	26
M981	C12155	CARRIER PERSONNEL TRACKED	16	0	16
M577	D11538	CARRIER COMMAND POST LIGHT	41	34	7
M992	C10908	CARRIER CGO TRACKED 7TON	35	0	35
M446A	F46067	CRANE WHEEL MTD 5 TON	3	0	3
	J74852	GRADER MOTORIZED DIESEL	4	0	4
M26	C20414	BRIDGE AVLB SCISSOR CL60 60'	8	2	6
M728	E56578	COMBAT ENGINEER VEHICLE	8	4	4
M9	W76473	TRCTR FT HIGH SPEED ACE	25	0	25
M320RT	F39378	CRANE WHEEL MTD 20 TON	3	0	3
	R11006	ROLLER MINE CLEARING	4	0	4
AVLB	L43664	LAUNCH M60 TANK CHASS AVLB	8	0	8
	T34437	TRCTR WHLD W/EXCAV FRONT LDR	4	0	4
D7F	W76816	TRCTR FT LOW SPEED DSL	6	0	6
	L76556	LOADER SCOOP DSL 2.5 CU YD	8	0	8
	V12141	TANK & PUMP UNIT LIQUID DISP	14	0	14
	V19950	TANK UNIT LIQ DISP TRL MTD	13	0	13
M13	D82404	DECONTAMINATING APPARATUS	11	0	11
M128	D20529	DISPENSER MINE GROUND VEH	4	0	4
M2	L28351	KITCHEN FLD TRAILER MTD	17	0	17
M88	R50681	RECOVERY VEHICLE FT MEDIUM	18	13	5
	T49255	TRUCK LIFT FORK DSL	3	0	3
M151A2	X60833	TRK UTIL 1/4 4X4 W/E	33	0	33
M818 WW	X59463	TRK TRACTOR 5TON 6X6 W/W/E	5	0	5
M1037	T07543	TRK UTILITY S250 SHELTER	9	0	9
M818	X59326	TRK TRACTOR 5TON 6X6 W/E	28	0	28
M817	X43845	TRK DUMP 5TON 6x6 W/W/E	6	0	6
M816	X63299	TRK WRECKER 5TON 6X6 W/W/E	10	0	10
M997	T38844	TRK AMBULANCE 4 LITTER HMMWV	1	0	1
M996	T38707	TRK AMBULANCE 2LITTR HMMWV	1	0	1
	T48944	TRUCK LIFT FORK DED	5	0	5
M916	T91656	TRK TRACTOR LET 6X6	5	0	5
M10A	T49119	TRUCK LIFT FORK 10000LB RT	2	0	2
M978	T87243	TRK TANK FUEL SVC 2500 GAL	16	0	16
M978 WW	T58161	TRUCK TANK FUEL SERVICING	4	0	4
M998	T61494	TRK UTIL 1-1/4 4X4 HMMWV	144	0	144
M984 WW	T63093	TRK WRK TAC HEMET	5	0	5
M1009	T05028	TRK UTILITY 3/4 W/E	49	0	49
M817	X43708	TRK DUMP 5TON 6X6 W/E	16	0	16
M1038	T61562	TRK UTIL 1-1/4 4X4 HMMWV W/E	4	0	4
M985	T39586	TRK CGO TACT HEMET MED CRANE	4	0	4
M880	X39432	TRUCK CARGO TACTICAL	6	0	6
M1008WW	T59482	TRK CGO 5/4 TON 4X4 W/E	21	0	21
M885	X39441	TRUCK CARGO TACTICAL	2	0	2
M813A1	X40931	TRK CGO DROP SIDE 5TON W/W/E	7	0	7
M882	X39447	TRUCK CARGO TACTICAL	3	0	3
M1008A1	T59346	TRK CGO 5/4 TON 4X4 W/COMMD	14	0	14
M883	X39450	TRUCK CARGO TACTICAL	6	0	6
M821	X56586	TRK STAKE 5TON 6X6 W/W/E	48	0	48
M35A2	X40009	TRUCK CGO 2-1/2	164	0	164
M813	X40968	TRK CGO 5TON LBW W/W/E	1	0	1
M35 DS	X40077	TRK CGO 2-1/2 DROP SIDE	10	0	10
M1028	T59414	TRK CGO 5/4 4X4 W/E	1	0	1
M35A2	X40146	TRK CGO 2-1/2 TON W/W W/E	24	0	24
HEMET	T59278	TRUCK CGO TACTICAL HEMET	31	0	31
M813A1	X40794	TRK CGO DROP SIDE 5 TON W/E	35	0	35
M886	X38592	TRUCK CARGO TACTICAL	5	0	5
M656	X41310	TRK CGO 5TON W/E	1	0	1
M997	T39518	TRK CGO TACT W/W HEMET W/CRA	2	0	2
M813	X40831	TRK CGO 5TON LWB W/E	24	0	24
M870	S70594	SEMITRAILOR HVY EQPT 55TON	5	0	5
M149A2	W98825	TRAILOR TANK WATER 400 GAL	30	0	30
M105A2	W95811	TRAILOR CARGO 1-1/2 TON	47	0	47
M172	S70517	SEMI TRAILOR LOW BED 40T	4	0	4
M48	J95533	GUIDED MISSLE SYSTEM CHAPARR	4	0	4
M163	J96694	GUN AIR DEFENCE SP 20MM	12	0	12
M109	K57667	HOWITZER MED SP 155MM	24	0	24
TOTALS		TOTALS	1175	53	1122

(2) **Alternatives 3 and 4**

(a) General. Computations of railcar reductions for Alternatives 3 and 4 were made based on whether units transported those vehicles considered for prepositioning to the NTC or left them at home station. Historical data on quantities of equipment transported to the NTC for the most recent rotation in 1986 were collected from the eight home stations. If the unit transported the type of vehicle considered for prepositioning, the number of railcars required to transport those vehicles authorized in the TOE was entered in a table and summed for each of the eight home stations and compared with the base case.

(b) Alternative 3. Table F-3 shows the calculated reduction in railcars by home station if equipment were prepositioned at NTC as proposed in Alternative 3. Table F-3 also identifies those CS/CSS vehicles that could be prepositioned at NTC. The average reduction in railcars per rotation is 144 + 56.5 = 200.5.

(c) Alternative 4. Table F-4 shows the calculated reduction in railcars by home station if additional equipment were prepositioned at NTC as proposed in Alternative 4. The average reduction in railcars per rotation is 27 and is additive to the reduction in Alternative 3.

(d) Railcar Summary. The number of railcars that could be reduced for each alternative from the base case per rotation are summarized as follows:

Alternative	Railcar reduction from base case
Base Case	0
Alternative 1	N/A*
Alternative 2	-56.5
Alternative 3	-200.5
Alternative 4	-227.5

*Computed for 18 months. No change from base case on a per rotation basis.

Table F-3. Alternative 3 Reduction in Railcars

Vehicles	Number of railcars reduced per home station							
	Hood	Riley	Polk	Benning	Carson	Stewart	Knox	Total
M172			2.0	2.0	2.0			6.0
M985	2.0							2.0
M10A	2.5		2.5			2.5		7.5
M98	2.0					2.0		4.0
M1008	11.7	11.7	11.7	11.7	11.7	11.7	11.7	81.9
M1028	.3	3	.3	3	3	3		1.8
M998	28.8							28.8
M1038	.8	8	.8	8	8	8	8	5.6
M984	2.5							2.5
M978						2.0		2.0
M105A2	6.7	6.7	6.7	6.7	6.7	6.7	6.7	46.9
M149A2	5.6	5.6	5.6	5.6	5.6	5.6	5.6	39.2
M35	66.0	66.0	66.0	66.0	66.0	66.0	66.0	462.0
M813	33.5	33.5	33.5	33.5	33.5	33.5	33.5	234.5
M818		16.5	16.5	16.5			16.5	66.0
M816		5.0	5.0	5.0		5.0		20.0
Total	162.4	146.1	150.6	148.1	126.6	136.1	140.8	1010.7

Note: The average number of railcars reduced in Alternative 3 by prepositioning is equal to 1010.7/7 or 144 railcars per rotation.

Table F-4. Reduction in Railcars Alternative 4

Vehicles	Number of railcars reduced per home station							
	Hood	Riley	Polk	Benning	Carson	Stewart	Knox	Total
M1009	9 8	9.8	9 8	9 8	9 8		9 8	58.8
M817			11 0	11 0		11 0		33.0
M151	3 3	3 3	3 3	3 3	3 3	3 3	3 3	23.1
M981		5 3	5 3		5 3	5 3		21 2
M13				11 0				11.0
M997							1	1.0
M109						12.0	12.0	24.0
M870	5.0	5.0	5.0		5.0			20.0
Total	18.1	23 4	34 4	35 1	23 4	31 6	26.1	192 1

Note: The average number of railcars reduced by prepositioning is equal to 192.1/7 or 27 railcars/rotation.

b. Cost Calculations

(1) Transportation Cost Savings. In 4 years, a total of 56 rotations will have been completed at a rate of 14 rotations per year. The average round trip cost per rotation for all home stations is $7,638. The savings per alternative in transportation cost is as follows:

Alternative	Cost $ FY 87	Number reduced from BC	Number rotations FY 88-91	Transportation savings FY 88-91 $ FY 87 (000)
1	N/A	N/A	N/A	N/A
2	$7,638	56.5	56	$24,167
3	$7,638	200.5	56	$85,759
4	$7,638	227.5	56	$97,308

(2) NTC Cost for Additional Prepositioned Equipment. The costs obtained and calculated from NTC input are as follows:

(a) Alternative 1. Costs are not included here since additional equipment is not being prepositioned at NTC for this alternative.

(b) Alternative 2. A nonrecurring cost was provided by NTC of $1,554,000. The annual recurring cost estimates provided by NTC is $2,386,015 and was calculated for 138 vehicles. A lower number of vehicles (84) is proposed for Alternative 2. The cost was reduced by the ratio of 84/138. Thus $2,386,015 times 84/138 equals $1,452,357/year.

(c) Alternative 3. The nonrecurring cost provided by NTC is $7,316,000. The annual recurring cost that was provided by NTC was $4,669,033 for 688 vehicles. The final list contained 806 vehicles. The costs were increased by the following ratio.

$$4,669,033 \times 806/688 = \$5,469,827$$

The recurring costs include the tracked vehicle costs contained in Alternative 2 of $1,452,357/year. Also, a recurring cost of $968,250 for maintaining electronic/communications equipment must be added. Summing the costs produces a total annual recurring cost of $7,890,434 for Alternative 3.

(d) Alternative 4. The nonrecurring cost of $9,048,000 was obtained from the NTC input. The annual recurring for Alternative 4 was calculated at $7,486,160 from NTC data. To this was added the annual recurring cost for Alternative 2 of $1,452,357 plus $968,250 for electronic/communications equipment maintenance shown in Alternative 3, since these items are additive. Summing the cost produces a total annual recurring cost of $9,906,767 for Alternative 4.

(3) NTC Cost Summary. The costs for the 4-year period are shown as follows. Costs have been rounded to thousands in constant dollars.

Alternative	Non-recurring	Annual recurring	Total* FY 88-91
BC	0	0	0
1	0	0	0
2	1,554	1,452	7,362
3	7,316	7,890	38,876
4	9,048	9,907	48,676

*Costs may be slightly different due to rounding.

(4) Cost for Alternatives. In the preceding paragraphs, the savings in transportation cost were calculated. Also, additional costs that would be incurred at NTC were determined. The resultant cost for each alternative is the base case cost less railcar savings plus NTC expenses. These are summarized as follows for the 4-year period FY 88-91 in $FY 87 (000).

Alternative	Base case cost	Trans savings	NTC cost	Total*	Δ
Base case	122,549	N/A	N/A	122,549	
1	122,549	43,341	0	79,208	43,341
2	122,549	24,167	7,362	105,744	16,805
3	122,549	85,759	38,876	75,666	46,883
4	122,549	97,308	48,676	73,917	48,632

*Totals may vary due to rounding.

APPENDIX G

THREE-BATTALION ROTATION

A three-battalion rotation, with 12 rotations per year, is scheduled to begin in FY 90. Table G-1 shows the equipment considered for prepositioning at NTC for a two-battalion rotation. Table G-2 is a strawman list of equipment that may be required for prepositioning for a three-battalion rotation.

Table G-1. Proposed Equipment for Prepositioning at NTC for a Two-battalion Rotation (page 1 of 2 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 07042J410 PROVIDED STOE	AUTH	NTC	UNIT BY	INFANTRY BATTALION 07345J410 PROVIDED STOE	AUTH	NTC	UNIT BY	ARMOR BATTALION 17235J410 PROVIDED STOE	AUTH	NTC	UNIT BY	ARTILLERY BATTALION 06375J4 PROVIDED STOE	AUTH	NTC	UNIT BY	ENGINEER COMPANY 05127J4 PROVIDED STOE	AUTH	NTC	UNIT BY	ADA COMPANY 44167J4 PROVIDED STOE	AUTH	NTC	UNIT BY	MI COMPANY 34285J4 PROVIDED STOE	AUTH	NTC	UNIT BY	COMBAT SVC SUPPORT 63001J4 PROVIDED STOE	AUTH	NTC	UNIT BY	TOTALS PROVIDED STOE	AUTH	NTC	UNIT BY
M1008A1	T59346	TRK CGO 3/4 TON 4X4 W/COMMO	0	4		4	0			0	0			0	0			0	0			0	0	1		1	0	1		1	0	7		7	0	13	0	13	0
M1028	T59414	TRK CGO 3/4 4X4 W/E	0	0		0	0			0	0			0	0			0	0			0	0	0		0	0	1		1	0			1	0	1	0	1	0
M1008AV	T59482	TRK CGO 3/4 TON 4X4 W/E	0	3		3	0			0	0			0	0	1		1	0	1		1	0	2		2	0	5		5	0	4		4	0	16	0	16	0
M998	T61494	TRK UTIL 1-1/4 4X4 HMMWV	0			0	0	26		26	0	18		18	0	39		39	0	6		6	0			0	0	12		12	0	16		16	0	117	0	117	0
M1038	T61562	TRK UTIL 1-1/4 4X4 HMMWV W/E	0			0	0			0	0			0	0	4		4	0			0	0			0	0			0	0			0	0	4	0	4	0
M984 W/	T63093	TRK WRK TAC HEMET	0			0	0			0	0	1		1	0	1		1	0			0	0	1		1	0			0	0			0	0	3	0	3	0
M978	T83243	TRK TANK FUEL SVC 2500 GAL	0			0	0			0	0	12		12	0			0	0	2		2	0			0	0			0	0			0	0	14	0	14	0
M916	T91656	TRK TRACTOR LET 6X6	0			0	0	0		0	0			0	0			0	0	2		2	0			0	0			0	0			0	0	3	0	3	0
	912141	TANK & PUMP UNIT LIQUID DISP	0			0	0	7		7	0			0	0	1		1	0	0		0	0	1		1	0	1		1	0	3		3	0	13	0	13	0
M60A1/A3	V13101	TANK FULL TRACKED 152MM	0			0	0			0	0	0	0	0	0			0	0			0	0			0	0			0	0			0	0	0	0	0	0
	919950	TANK UNIT LIQ DISP TRL MTD	0			0	0	7		7	0			0	0	1		1	0	0		0	0			0	0	1		1	0	3		3	0	12	0	12	0
M9	V76473	TRCTR FT HIGH SPEED ACE	0			0	0			0	0			0	0			0	0	6		6	0			0	0			0	0			0	0	6	0	6	0
D7F	V76816	TRCTR FT LOW SPEED DBL	0			0	0			0	0			0	0			0	0	6	0	6	0			0	0			0	0			0	0	6	0	6	0
M105A2	V95811	TRAILOR CARGO 1-1/2 TON	0			0	0			0	0	20		20	0			0	0			0	0			0	0			0	0	27		27	0	47	0	47	0
M149A2	V90825	TRAILOR TANK WATER 400 GAL	0	1		1	0	6		6	0	5		5	0	6		6	0	1		1	0	1		1	0			0	0	5		5	0	25	0	25	0
M886	X38592	TRUCK CARGO TACTICAL	0			0				0				0				0				0				0				0		5		5	0	5	0	5	0
M880	X39432	TRUCK CARGO TACTICAL	0			0				0				0				0				0				0				0		6		6	0	6	0	6	0
M885	X39441	TRUCK CARGO TACTICAL	0			0				0				0				0				0				0				0		2		2	0	2	0	2	0
M882	X39447	TRUCK CARGO TACTICAL	0			0				0				0				0				0				0				0		9		9	0	9	0	9	0
M883	X39450	TRUCK CARGO TACTICAL	0			0				0				0				0				0				0				0		6		6	0	6	0	6	0
M35A2	X40009	TRUCK CGO 2-1/2	0	2		2	0	21		21	0	23		23	0	32		32	0	5		5	0			0	0	19		19	0	29		29	0	133	0	133	0
M35 DS	X40077	TRK CGO 2-1/2 DROP SIDE	0			0	0	4		4	0			0	0			0	0			0	0			0	0	5		5	0	1		1	0	10	0	10	0
M35A2	X40146	TRK CGO 2-1/2 TON W/W W/E	0	2		2	0	12		12	0	5		5	0			0	0	1		1	0			0	0			0	0	9		3	0	23	0	23	0
M813A1	X40794	TRK CGO DROP SIDE 5 TON W/E	0	1		1	0	23		23	0	2		2	0			0	0			0	0	4		4	0			0	0	5		5	0	35	0	35	0
M813	X40831	TRK CGO 5TON LWB W/E	0			0	0	7		7	0	1		1	0	3		3	0			0	0	4		4	0	2		2	0	7		7	0	24	0	24	0
M813A1	X40931	TRK CGO DROP SIDE 5TON W/W/E	0			0	0	4		4	0			0	0	3		3	0			0	0			0	0			0	0			0	0	7	0	7	0
M813	X40968	TRK CGO 5TON LOW W/W/E	0			0	0	1		1	0			0	0			0	0			0	0			0	0			0	0			0	0	1	0	1	0
M656	X41310	TRK CGO 5TON W/E	0			0	0			0	0			0	0			0	0	5		5	0			0	0			0	0			0	0	5	0	5	0
M817	X43700	TRK DUMP 5TON 6X6 W/E	0			0	0			0	0			0	0			0	0	5		5	0			0	0			0	0			0	0	5	0	5	0
M817	X43845	TRK DUMP 5TON 6x6 W/W/E	0			0	0			0	0			0	0			0	0	1		1	0			0	0			0	0			0	0	1	0	1	0
M821	X56506	TRK STAKE 5TON 6X6 W/W/E	0			0	0			0	0			0	0			0	0	0		0	0			0	0			0	0			0	0	0	0	0	0
M818	X59326	TRK TRACTOR 5TON 6X6 W/E	0			0	0			0	0			0	0			0	0	0		0	0			0	0			0	0	27		27	0	27	0	27	0
M818 W/	X59462	TRK TRACTOR 5TON 6X6 W/W/E	0			0	0			0	0	4		4	0			0	0			0	0			0	0			0	0	1		1	0	5	0	5	0
M131A2	X40033	TRK UTIL 1/4 4X4 W/E	0			0	0			0	0			0	0			0	0			0	0	32		32	0			0	0	1		1	0	33	0	33	0
M816	X63299	TRK WRECKER 5TON 6X6 W/W/E	0			0	0	2		2	0	1		1	0			0	0			0	0			0	0	1		1	0	6		6	0	10	0	10	0
TOTALS		TOTALS	0	29	0	29	0	242	39	283	0	219	82	137	0	237	13	224	0	77	10	59	0	75	4	71	0	99	7	92	0	214	9	205	0	1192	374	987	0

Table G-1. Proposed Equipment for Prepositioning at NTC for a Two-battalion Rotation (page 2 of 2 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410 PROVIDED BY				INFANTRY BATTALION 07345J410 PROVIDED BY				ARMOR BATTALION 17235J410 PROVIDED BY				ARTILLERY BATTALION 06375J4 PROVIDED BY				ENGINEER COMPANY 05127J4 PROVIDED BY				ADA COMPANY 44167J4 PROVIDED BY				MI COMPANY 34205J4 PROVIDED BY				COMBAT SVC SUPPORT 43001J4 PROVIDED BY				TOTALS PROVIDED BY			
			BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT		BTOE AUTH	NTC	UNIT	
M992	C10900	CARRIER CGO TRACKED TTON	0				0	0			0	0			0	0	24		24	0			0	0			0	0	11		11	0			0	0	35	0	35	0
M901	C12155	CARRIER PERSONNEL TRACKED	0				0	0			0	0			0	0	16		16	0			0	0			0	0			0	0			0	0	16	0	16	0
M26	C20414	BRIDGE AVLB SCISSOR CL60 60'0					0	0	2		2	0			0	0	6	2	4	0			0	0			0	0			0	0			0	0	8	2	6	0
M3	C74335	CALVARY FIGHTING VEHICLE	0	0	0		0	0	7	0	7	0	6	0	6	0			0	0			0	0			0	0			0	0			0	0	13	0	13	0
M106	D10741	CARRIER 107MM MORTAR	0				0	0	6	0	6	0	6	0	6	0			0	0			0	0			0	0			0	0			0	0	12	0	12	0
M548	D11049	CARRIER CGO TRACKED 6TON	0				0	0			0	0			0	0	24	0	24	0	0	0	0	0			0	0			0	0			0	0	26	0	26	0
M577	D11530	CARRIER COMMAND POST LIGHT	0	6	0		6	0	0	0	0	0	0	6	2	0	13	3	10	0	1	0	1	0	1		1	0	2		2	0			0	0	39	24	7	0
M113	D12007	CARRIER PERSONNEL FULL TRACK	0	1	9		1	0	23	22	1	0	11	11	0	0	10	10	0	0	12	12	0	0	4	4	0	0	12	7	5	0	9	9	0	0	82	200	0	0
M128	D20529	DISPENSER MINE GROUND VEH	0				0	0			0	0			0	0			0	0	1		1	0			0	0			0	0			0	0	1	0	1	0
M13	D82484	DECONTAMINATING APPARATUS	0				0	0	2		2	0	2		2	0	2		2	0	1		1	0	1		1	0	2		2	0			0	0	10	0	10	0
M728	E56570	COMBAT ENGINEER VEHICLE	0				0	0			0	0			0	0			0	0	2	2	0	0			0	0			0	0			0	0	2	4	4	0
M901	E56896	COMBAT VEHICLE ANTITANK ITV	0	0	0		0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	56	0	0
M328BT	F39370	CRANE WHEEL MTD 20 TON	0				0	0			0	0			0	0			0	0	0		0	0			0	0			0	0			0	0	0	0	0	0
M446A	F46067	CRANE WHEEL MTD 5 TON	0				0				0				0				0				0				0	0			0	2			3	0	0	0
	J74052	GRADER MOTORIZED DIESEL	0				0	0			0	0			0	0			0	0	0		0	0			0	0			0	0			0	0	0	0	0	0
M2	J81750	INFANTRY FIGHTING VEHICLE	0	0	0		0	0	54	0	54	0			0	0			0	0			0	0			0	0			0	0			0	0	54	0	54	0
M48	J95533	GUIDED MISSLE SYSTEM CHAPARR	0				0	0			0	0			0	0			0	0			0	0	4	0	4	0			0	0			0	0	4	0	4	0
M163	J96694	GUN AIR DEFENCE SP 20MM	0				0	0			0	0			0	0			0	0			0	0	12	0	12	0			0	0			0	0	12	0	12	0
M109	K57667	HOWITZER MED SP 155MM	0				0	0			0	0			0	0	24	0	24	0			0	0			0	0			0	0			0	0	24	0	24	0
M2	L28351	KITCHEN FLD TRAILER MTD	0	1			1	0	3		3	0	5		5	0	5		5	0			0	0			0	0			0	0	3		3	0	17	0	17	0
AVLB	L43664	LAUNCH M60 TANK CHASS AVLB	0				0	0			0	0	2		2	0			0	0	2	2	0	0			0	0			0	0			0	0	4	0	2	0
	L76356	LOADER SCOOP DBL 2 5 CU YD	0				0	0			0	0			0	0			0	0	1		1	0			0	0			0	0			0	0	1	0	1	0
	M11006	ROLLER MINE CLEARING	0				0	0			0	0	4		4	0			0	0			0	0			0	0			0	0			0	0	4	0	4	0
M578	M50544	RECOVERY VEHICLE FT LIGHT	0	1			1	0	0	0	0	0			0	0	2	0	2	0			0	0			0	0	1		1	0			0	0	4	9	0	0
M88	M50681	RECOVERY VEHICLE FT MEDIUM	0				0	0	7	5	2	0	7	7	0	0			0	0	1	0	1	0	1		1	0			0	0	1	0	1	0	17	13	5	0
M172	S70517	SEMI TRAILOR LOW BED 40T	0				0	0			0	0	4		4	0			0	0			0	0			0	0			0	0			0	0	4	0	4	0
M870	S70554	SEMITRAILOR HVY EQPT 55TON	0				0	0			0	0			0	0			0	0	3		3	0			0	0			0	0			0	0	3	0	3	0
M1009	T05020	TRK UTILITY 3/4 W/E	0	7			7	0			0	0	1		1	0			0	0	2		2	0	1		1	0	23		23	0	9		9	0	43	0	43	0
M1037	T07543	TRK UTILITY S250 SHELTER	0				0	0			0	0			0	0	2		2	0			0	0			0	0			0	0	7		7	0	9	0	9	0
M1	T13374	TANK COMBAT FT 105MM ABRAMS	0				0	0			0	0	58	58	0	0			0	0			0	0			0	0			0	0			0	0	58	58	0	0
	T34437	TRCTR WHLD W/WINCH FRONT LOD	0				0	0			0	0			0	0			0	0	1		1	0			0	0			0	0			0	0	1	0	1	0
M996	T38707	TRK AMBULANCE 2LITTR HMMWV	0				0	0			0	0			0	0			0	0	0		0	0			0	0			0	0			0	0	0	0	0	0
M997	T38844	TRK AMBULANCE 4 LITTER HMMWV	0				0	0			0	0			0	0	1		1	0			0	0			0	0			0	0			0	0	1	0	1	0
M997	T39518	TRK CGO TACT W/M HENET W/CRA	0				0	0			0	0			0	0			0	0	2		2	0			0	0			0	0			0	0	2	0	2	0
M985	T39586	TRK CGO TACT HENET MED CRANE	0				0	0			0	0			0	0	0		0	0			0	0			0	0			0	0			0	0	0	0	0	0
	T40944	TRUCK LIFT FORK DED	0				0				0				0				0				0				0				0	5			5	0	5	0	5	0
M88A	T49119	TRUCK LIFT FORK 100000LB RT	0				0	0			0	0			0	0			0	0			0	0			0	0			0	0	1		1	0	1	0	1	0
	T49253	TRUCK LIFT FORK DSL	0				0				0				0				0				0				0				0	3			3	0	3	0	3	0
M970 W/	T50161	TRUCK TANK FUEL SERVICING	0				0	0			0	0			0	0	1		1	0			0	0	3		3	0			0	0			0	0	4	0	4	0
HENET	T59270	TRUCK CGO TACTICAL HENET	0				0	0			0	0	9		9	0	22		22	0			0	0			0	0			0	0			0	0	31	0	31	0

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 1 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 5127?J4 TOE AUTH	AIR DEFENCE COMPANY 4416?J4 TOE AUTH	MI COMPANY 34295J4 TOE AUTH	COMBAT SVC SUPPORT 63?05J4 TOE AUTH	TOTAL TOE AUTH
	A01870	ACCY KIT MK-1259/GRC		7	7	7		2	1		1	25
	A01872	ACCY KIT MK-1265/GRC	2	28	23	23	40	36	5	12	9	178
	A01873	ACCY KIT MK1262/VIC-1 M113				0		4	5			9
	A01876	ACCY KIT MK-1261/GRC		8		0	10					18
	A01877	ACCY KIT MK1266/V				0			9			9
	A01878	ACCY KIT MK-1267/V				0			3			3
	A01885	ACCY KIT MK1274/G				0		8				8
	A01887	ACCY KIT MK-1277/GRC			2	2		4				8
	A01900	ACCY KIT MK-1289/GRC		12		0						12
	A01902	ACCY KIT MK-1291/GRC		6	6	6						18
	A01908	ACCY KIT MK-1320/V		0	2	2		3				7
	A01909	ACCY KIT MK-1321/V				0	10					10
	A01913	ACCY KIT MK-1326/GRC	6	16	11	11	11		2	3		60
	A01920	ACCY KIT MK-1333/GRC-106A	1			0			1			2
	A01921	ACCY KIT MK-1334/GRC-106A	1			0			5			6
	A01936	ACCY KIT MK-1296/G	1			0	3			1		5
	A01941	ACCY KIT MK-1301/VIC-1				0	24					24
	A01942	ACCY KIT MK-1302/G			24	24		25				73
	A01943	ACCY KIT MK-1303/V			34	34						68
	A02010	ACCY KIT MS-1506/USC-3	1	1	1	1						4
	A03210	ACCY OUTFIT GAS FLD RANGE	1	2	5	5	8	6	1	1	3	32
	A04054	AUTOMATIC PRESELECTOR				0				1		1
	A10769	ADAPTER HARDWARE FVS		6	1	1					2	10
	A13837	ADAPTER HARDWARE M1 PECULIAR			6	6					2	14
	A19905	ADAPTER HARDWARE POWER				0					2	2
	A22496	AIMING CIRCLE		2	2	2	20			3		29
	A23291	ALIGNMENT TEST SET				0					1	1
	A23701	AIRCONDITIONER FL/WNDW				0	2			4		8
	A23828	AIRCONDITIONER FL/W				0					14	14
	A24455	AIRCONDITIONER FLOOR MTG				0				5	2	7
	A24592	AIRCONDITIONER FLOOR MTD				0				3	1	4
	A24743	AIRCONDITIONER FL/W				0					1	1
	A24934	AIRCONDITIONER FL/WALL				0				3		3
	A32060	ALARM CHEMICAL MAN PACK	4	28	45	45	13	11	13	21	13	223
	A34938	AIMING LIGHT INFRA RED AN/PA		72		0						72
	A44470	AMPLIFIER AUDIO FREQ				1	1					1
	A53491	AMPLIFIER PWR SUPPLY GP OG-1				0	54					54
	A55233	ANALYZER CHARGER BATERY				1					1	1
	A55372	ANALYZER DATA TELEGRAPH				1					1	1

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 2 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44147J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 43885J4 TOE AUTH	TOTAL TOE AUTH
	A56243	ANALYZER SET ENGINE/STE/ICE	1	6	5	5	6	7	1	4	8	43
	A57322	ANALYZER SPECTRUM IP-1216				0				1		1
	A58233	ANALYZER SPECTRUM TS				0					6	6
	A70522	ADAPTER ELEC SYS BREAKOUT			6	6						12
	A71438	ANTTENA AT-784/PRC		15	3	3						21
	A71712	ANTENNA AT-954/G				0	42			12		54
	A72260	ANTENNA RC-292				0					1	1
	A78151	ANTENNA GROUP AN/GRA				0					1	1
	A79381	ANTENNA GROUP OE-254	8	28	12	12	57	24	10	22	1	174
	A79449	ANTENNA GRP OE-303/GRC		5		0	26	5	2		4	42
	A99385	ANTTENUATOR				0					4	4
	A99659	ANTENUATOR VARIABLE CN-796/G				0				4	1	5
	B07126	AXLE CABLE REEL RL-27	1	6	1	1	8	4	1		2	24
	B11795	BOTTLE CLEANING CHARG				0					1	1
	B12701	BREAKOUT BOX ALIGNMENT				0					1	1
	B37240	BASE MAST AB-652/GR				0				1		1
	B90426	BORESIGHTING EQPT MUZZLE AL			58	58				8		116
M992	C10908	CARRIER CGO TRACKED 7TON				0	24			11		35
M981	C12155	CARRIER PERSONNEL TRACKED				0	16					16
	C17797	COMPUTER SET FLD ARTY GEN				0	8					8
	C19266	COUNTER ELECTRONIC OI				0					6	6
M26	C20414	BRIDGE AVLB SCISSOR CL60 60'			2	2		4				10
	C20654	BRIDGE CAPACITANCE-IN				0					1	1
	C23901	COUNTER PULSE ELECTRONIC				0				1		1
	C36151	CRANE WHEEL MTD HYD				0					2	2
	C38422	BURNER UNIT GASOLINE	4	16	20	20	20	24		4	12	120
	C40499	COMPUTER GUN GRP DIRECTION				0	6					6
	C49294	COMPUTER SET BALLISTIC MORTA		4	4	4						12
	C60752	COMMUNICATIONS TERMINAL AN/T				0				1		1
	C62375	BATTERY CASE Z-AIJ-E1	19	107	40	40	201	75	32	47	39	450
	C65800	CASE GUIDED MISL INFRA RED T		36	3	3		24				66
	C66253	CABLE ASSBLY TEL CX-4566/G				0	2					2
	C66390	CABLE ASSBLY TEL CX-4760/U				0	5					5
	C68719	CABLE TELEPHONE WD-1/TT	4	129	92	92	170	71	132	18	14	450
	C69856	CABLE TELEPHONE WD-1/TT RL-	1	5	2	2	54	21			9	91
	C58993	CABLE TELEPHONE WD-1/TT MX-	16	28		0	23	23				90
	C69541	CABLE TELEPHONE WF-16/U				0			4			4
M3	C76335	CALVARY FIGHTING VEHICLE	3	6	4	6						19
	C78793	CENTRAL OFFICE TEL AUTO	2			3						5
	C84041	CONTACT SUPPORT SET				0					1	1
	C89070	CAMOUFLAGE SCREE SUPPORT SYS				3			93			93
	C89145	CAMOULFLAGE SCREEN SYSTEM	86	471	159	159	329	412	99	289	444	2848
	C89179	CAMOULFLAGE SCREEN SYSTEM				3	2		36	15		53
	C89213	CAMOUFLAGE SCREEN SUPPORT	86	471	159	159	330	412	71	294	444	2848
	C94989	CHARGER BAT PP-7382/TAS	2	17	1	1	4				3	28

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 3 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	#	INFANTRY BATTALION MHC BDE 87042J410	INFANTRY BATTALION 07345J410	ARMOR BATTALION 17235J410	ARMOR BATTALION 17235J410	ARTILLERY BATTALION 06375J4	ENGINEER BATTALION 05127J4	AIR DEFENCE COMPANY 44157J4	MI COMPANY 34285J4	COMBAT SVC SUPPORT 43095J4	TOTAL TOE AUTH
			#	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH
	032454	DETECTING SYSTEM SPEC PURPOS	#				0				1		1
M106	010741	CARRIER 107MM MORTAR	#		4	4	4						10
M548	011044	CARRIER CGO TRACKED 6TON	#				0	24	2				26
M577	011538	CARRIER COMMAND POST LIGHT	#	6	8	8	8	13	3	1	2		49
M113	012087	CARRIER PERSONNEL FULL TRACK	#	1	23	11	11	10	40	5	12	9	122
M128	020529	DISPENSER MINE GROUND VEH	#				0		4				4
	031557	DATA DISPLAY GRP M109	#				0	24					24
	077692	DATA ANALYSIS CENTRAL	#				0				3		3
	077712	DATA ANALYSIS CENTRAL	#				0				2		2
	077780	DATA ANALYSIS CENTRAL	#				0				3		3
M13	082404	DECONTAMINATING APPARATUS	#		2	2	2	2	2	1	2	4	17
	099025	CHARGER BATTERY PP-1659/G	#				0	1		1			2
	099419	CHARGER BATTERY PP-4127/U	#				0				12		12
	099863	CHARGER BATTERY PP-4804/TT	#		4	1	1						6
	E01727	ELECTRONIC COUNTER COUNTER MO	#	19		204	204	169	189		18	13	716
	E45746	CODE CHANGER KEY KIR-18/TSEC	#				0			8			8
	E48787	COIL TELEPHONE REPEATER, C168	#				0	10					10
M728	E54578	COMBAT ENGINEER VEHICLE	#				0		8				8
M901	E56896	COMBAT VEHICLE ANTITANK ITV	#	0	12	3	3	0	0	0	0	0	18
	E69242	COMP UNIT RCP AIR	#		1	1	1	6	1		1	2	13
	E70064	COMP UNIT RCP TRK 2WHL	#	1	5	4	4		5	1		3	23
	E73426	COMP UNIT RTY AIR MNPW	#				0		10				10
	E94970	CONTROL RADIO SET C 2299/VRC	#				0	2					2
	E98103	ELEC TRANSFER KEYING DEVICE	#	5	10	26	26	14	4	9	14	5	115
	F05444	CONVERTER TELEPHONE SIGNAL	#				0			1			1
	F37457	CONVEYOR ROLLER GRAVITY	#				0					0	0
	F25418	COUPLER DIRECTIONAL CU-209/G	#				0				2		2
M776D1	F39328	CRANE WHEEL MTD 20 TON	#				0		3				3
M44A	F43067	CRANE WHEEL MTD 5 TON	#				0					3	3
	F57467	FIRE SPT TEAM DIGITAL MSG DE	#				0	13					13
	F83626	FIRE DIRECTION CENTER ART	#				0	1					1
	F91490	DEMOLITION SET EXPL	#		5	1	1	4	32				44
	G02284	DETECTION SET PTBL METL & NON	#		2	1	1	9	49	1		3	62
	G02341	DETECTION SET PTBL METL	#		4	2	2	4	30	1		4	47
	G21472	DISPENSING PUMP HAND	#				0					3	3
	G24513	DISTORTION ANALYZER	#				1					1	2
	G26515	DISTORTION ANALYZER AN/UGM-18	#				1				1		2
	G29015	DISTRIBUTOR WATER COL:ARSIBLE	#				1	1					2
	G35981	GEN ST DSL ENG 10KW	#				1				1		2
	G54451	GENERATOR SIGNAL SG-1144	#				1				4		5
	G57933	DRILL PNEUMATIC	#				1		1				2
	G64176	DRIVER PROJECTILE POWDER ACT	#				1						1
	G76582	TEST SET ELECTRICAL POWER	#				1					1	2
	G77409	DUMMY LOAD ELECTRICAL	#				0					1	1
	G77811	DUMMY LOAD ELECTRICAL DA 150	#				1					1	2

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 4 of 14 pages)

VEHICLE LINE TYPE	NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44147J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 43005J4 TOE AUTH	TOTAL TOE AUTH
	G33247	GROUND SUPPORT EQPT					0				1	1
	H01814	ELECTRONIC KEY GEN 1/2 DUPLE					0			2		2
	H01836	ELECTRONIC KEY GEN 1/2 DUPLE					0	13		3		16
	H01907	ELECTRONIC SHOP SHELTOR					0			6	7	13
	H01912	ELECTRONIC SHOP SHELTOR					0			4	4	8
	H02173	ELECTRONIC SHOP TRANSPORTABL					0			2		2
	H02300	ELECTRONIC TELETYPE WRITER	1	1	1	1	3	3		20		30
	H17660	HARNESS GN EQUIPT TRANSPORT					0		20			20
	H31136	FACSIMILE SET AN/TXC					0				3	3
	H32869	FARELEAD ROLLER					0	1				1
	H51856	FILTER SEPARATOR					0			1		1
	H51915	FILTER SEPARATOR LIQ FUEL					0	1				1
	H55843	FIRE DIRECTION SET ART					0	14				14
	J34465	GENERATOR PULSE SG-366/U					0			1		1
	J35492	GEN ST DSL EMG TM					0				8	8
	J35813	GEN ST DSL EMG 5KW		2			0	1	6	1	6	17
	J35825	GEN ST DSL EN 10KW					0				1	1
	J36383	GEN ST DSL EN 30KW					0				1	1
	J36725	GEN ST DSL EN 30KW					0			5		5
	J41452	GEN ST GAS EN 10KW					0	1				1
	J42100	GEN ST GAS EN 10KW					0	1		7	11	19
	J43027	GEN ST GAS EN 5KW					0			14		14
	J43918	GEN ST GAS EN 1 5KW			9	1	1	1	2	2	4	20
	J44055	GEN ST GAS EN 1 5KW 28VT			1	1	1	18	2	2	3	28
	J45699	GEN ST GAS EN 3KW	1	1			0	4	20	4	3	2	35
	J45934	GEN ST GAS EN 3KW					0			3	2	1	6
	J46110	GEN ST GAS EN 3KW 28VT DC	2	2	1	1	2	1	1	2	1	13
	J46384	GEN ST GAS EN 3KW 60HZ	1	1	1	1					1	5
	J47343	GEN ST GAS EN 5KW					0	1				1
	J47480	GEN ST GAS EN 5KW					0			1		1
	J47617	GEN ST GAS EN 5KW	2				0	2	7	9		16
	J47398	GEN ST GAS EN 10KW					0				1	1
	J49809	GEN ST GAS EN TM 10					0				2	2
	J53712	GEN SIGNAL AN/	0				0				2	2
	J53721	GEN SIGNAL AN/URM-170					0			1		1
	J53974	GEN SIGNAL AN/USM-213					0			2		2
	J55992	GEN SIGNAL SG-340/G					0			2		2
	J56362	GEN SIGNAL SG-747/U					0			1		1
	J56371	GEN SIGNAL SG-944/U					0			1		1
	J56382	GEN SIGNAL SG-					0				1	1
	J58919	GEN SWEEP SIGNAL AN/USM-203					0			1		1
	J60285	INTRA VEHICULAR REMOTE C-112				36	36		2			74
	J74852	GRADER MOTORIZED OSL					0	4				4
	J81750	INFANTRY FIGHTING VEH M2	0	54			0					54
	J87979	INSTALLATION KIT ELEC EQPT					0	11				11

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 5 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	TOE AUTH	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44167J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 63005J4 TOE AUTH	TOTAL TOE AUTH
	J95533	GUIDED MISSLE SYSTEM CHAPPAR		0			0			4			4
M1A3	J96494	GUN AIR DEFENCE ARTY SP 20MM					0			9			9
	J97635	INTERMEDIATE MAINT KIT					0				1		1
	J98501	INTERROGATOR SET AN/PPX-3 S					0			37			37
	K14814	HAND SET H-189/GR					0	1					1
	K23814	HEADSET-MICROPHONE H-102/PT			6	6	6	49	3	18		4	92
	K25342	HEATER IMMERSION		4	8	36	36	44	56		12	20	216
	K38298	HOIST CHAIN					0		7				7
	K47271	KIT MOUNTING MINE CLEARING				12	12						24
	K49775	HOSE ASSEMBLY RUB WTR SW					0					1	1
	K52926	HOSE ASSEMBLY NONMETALLIC WA			6	6	6	6	6	3	6	12	51
	K53748	HOSE ASSEMBLY NONMETALLIC FU			8	8	8	8	8	4	8	14	48
	K57667	HOWITZER MED SP 155MM					0	24					24
	K73263	INDICATOR CHANNEL ALIGNMENT					0		1				1
	K87233	INSTL KIT MK-1224/VRC49		1			0				3		4
	K87234	INSTL KIT MK-1225/VRC48					0			4			4
	K87243	INSTL KIT MK-1234/G VRC46		7		2	2		1	50	22	2	86
	K87248	INSTL KIT F/AN/VRC-43					0	2					2
	K87254	INST KIT MK1246/GRC		1			0						1
	K87269	INSTL KIT MK-1306/VRC47					0		3	2	1	4	10
	K87281	INSTL KIT MK-1373/GRC-106					0			4			4
	K87323	INSTL KIT MK-1438/VRC49					0	2					2
	K87328	INSTL KIT MK-1443/VRC46				2	2			3	12	7	26
	K87330	INSTL KIT MK1445/VRC47					0				6	1	7
	K87337	INSTL KIT MK-1453/VIC-1					0			5			5
	K87338	INSTL KIT MK-1454/U			2		0	2					4
	K87444	INSTL KIT MK-1738/GRC					0				1	8	9
	K87449	INSTL KIT MK-1810/VRC47				8	8	2	21		2	2	51
	K87452	INSTL KIT MK-1813/VRC49			25	3	3	3	1			4	39
	K87454	INSTL KIT MK-		0			0					2	2
	K87456	INSTL KIT MK-1817/GRC			6	13	13	3	11	2	8	28	88
	K87536	INSTL KIT MK-1838VRC		7		16	16		1	14	24	2	90
	K87537	INSTL KIT MK-1839VRC KY57					0		4		1	4	9
	K87538	INSTL KIT MK-1840VRC KY57			6	15	15	20	13	2	6	21	98
	K87539	INSTL KIT MK-1841VRC KY57		1			0				3		4
	K87540	INSTL KIT MK-1842VRC KY57					0			20	1		21
	K87543	INSTL KIT MK-1845VRC KY57			4		0					1	5
	K87544	INSTL KIT MK-1846VRC KY57		2	46	7	7	16		9		4	90
	K87545	INSTL KIT MK-1847VRC KY57		6	14	9	9	11		2	3		54
	K87546	INSTL KIT MK-1848VRC KY57				24	24						48
	K87547	INSTL KIT MK-1849VRC KY57				1	1		3	1			5
	K87548	INSTL KIT MK-1850VRC KY57				24	24		37				95
	K87549	INSTL KIT MK-1851VRC KY57			2	2	2						6
	K87550	INSTL KIT MK-1852VRC KY57			2	2	2	2		7	1	1	17
	K87551	INSTL KIT MK-1853VRC KY57		1			3	3			1		5

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 6 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 04375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44147J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 43065J4 TOE AUTH	TOTAL TOE AUTH
	K87554	INSTL KIT MK-1856VRC KY57		33	18	18	34	36		12	5	156
	K87555	INSTL KIT MK-1857VRC KY57				0		4	21			25
	K87557	INSTL KIT MK-1859VRC KY57	1	1		0						2
	K87559	INSTL KIT MK-1861VRC KY57		23	3	3	3	1			4	37
	K87560	INSTL KIT MK-1862VRC KY57		3	7	7		2				19
	K87561	INSTL KIT MK-1863VRC KY57			8	8	9	20		3	2	50
	K87562	INSTL KIT MK1864VRC KY57				0	7	2		2	10	21
	K87563	INSTL KIT MK1865VRC KY57				0				4		4
	K87564	INSTL KIT MK1866VRC KY57				0	5			12	5	22
	K87565	INSTL KIT MK-1867VRC KY57				0	10					10
	K87566	INSTL KIT MK-1868VRC	1			0					1	2
	K93373	INTERCOMMUNICATION SET AN/VI				0			1			1
	L00073	ENTRENCHING OUTFIT IN		1		0						1
	L00984	INVERTER VIBRATOR PP-1703	1			0					1	2
M2	L28351	KITCHEN FLD TRAILER MTD	1	3	5	5	5	6		1	3	29
	L40063	LASER INFRA RED OBS SET		3	3	3	43	8				40
AVLB	L43664	LAUNCH M60 TANK CHASS AVLB			2	2		4				8
	L44031	LAUNCHER SMOKE M257		48	7	7		8				82
	L44595	LAUNCHER GRENADE SMOKE M239			14	14	50	89	24		17	208
	L44612	LAUNCHER GRENADE SMOKE SINGL		7	7	7		14	1		1	37
	L44680	LAUNCHER GRENADE SMOKE M250			58	58						116
	L44748	LAUNCHER GRENADE SMOKE M259	1	21	4	4		45	3	12	1	111
	L44999	LAUNCHER ROCKET PRACTICE MI	4	22		0		20				46
	L45250	LAUNCHER ROCKET 66MM 4-TUBE		12	4	4						20
	L45740	LAUNCHER TUBULAR GUIDED MSL		12	2	2						16
	L63583	LIGHT SET CHART FLD				0				1	1	2
	L63994	LIGHT SET GEN ILLUM	4	3	58	58	6	8	1		10	148
	L65501	LIGHT TGT SURVEY,RANGE POLE				0	1					1
	L67021	LAUNCHER GRENADE SMOKE M243		12		0	16					28
	L76556	LOADER SCOOP OSL 2 5 CU YD				0		8				8
	L78762	LOCKING DEVICE ATOMIC WPN TRA				0	3					3
	L83413	LOUDSPEAKER PERM MAG LS-166	1			0			25			31
	L85283	LUBRICAT-SERVICE UNIT POWER				0		1				1
	L91701	MACHINEGUN CALIBRE 50			58	58					3	119
	L91975	MACHINEGUN CALIBRE 50	5	39	35	35	58	1	10	14	7	204
	L92112	MACHINEGUN 50 CAL VEH MNTD				0		8				8
	L92352	MACHINEGUN 7 62 FIXED			116	116		8				240
	L92386	MACHINEGUN 7 62		33	9	9	44	31	21		13	159
	M02109	MAINT KIT ELEC MK-1961/U				0				2		2
	M02309	MAINT KIT ELEC MK-1928/MSQ-18				0				1		1
	M04941	METEOROLOGICAL DATA SYS AN/TM			0	0	1					1
	M14381	MAST AB903/G		2		0						2
	M14450	MAST BRACKET MP50				0				2		2
	M29273	MAINTENANCEKIT ANAL				0					3	3
	M29356	MR TIMETER DIGITAL DISPLAY				0			2	8	6	16

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 7 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	UIC	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 04375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44147J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 43005J4 TOE AUTH	TOTAL TOE AUTH
M88	X39592	TRK CGO TACTICAL AMBULANCE					0					5	5
M37	X39432	TRK CGO TAC 1-1/4					0					4	4
M885	X39441	TRK CGO TAC 1-1/4					0					2	2
M882	X39447	TRK CGO TAC 1-1/4					0					6	6
M883	X39450	TRK CGO TAC 1-1/4					0					6	6
M35A2	X40009	TRK CGO 2-1/2		2	21	25	25	32	36		19	29	189
M35 DS	X40077	TRK CGO 2-1/2 DROP SIDE			4		0				5	1	10
M35A2	X40146	TRK CGO 2-1/2 TON W/W W/E		2	12	5	5		2			3	29
	X40283	TRK CGO 2-1/2 TON					0					2	2
M813A1	X40794	TRK CGO DROP SIDE 5 TON W/E		1	23	2	2			4		5	37
M813	X40831	TRK CGO 5TON LWB W/E			7	1	1	3		4	2	7	25
M813A1	X40931	TRK CGO DROP SIDE 5TON W/W/E			4		0	3					7
M813	X40968	TRK CGO 5TON LBW W/W/E			1		0						1
M554	X41310	TRK CGO 5TON W/E					0		1				1
M817	X43708	TRK DUMP 5TON 6X6 W/E							16				16
M817	X43845	TRK DUMP 5TON 6x6 W/W/E							4				4
M821	X56586	TRK STAKE 5TON 6X6 W/W/E							48				48
M818	X59326	TRK TRACTOR 5TON 6X6 W/E							1			27	28
M818 W/	X59463	TRK TRACTOR 5TON 6X6 W/W/E				4	4					1	9
M151A2	X40833	TRK UTIL 1/4 4X4 W/E								32		1	33
	X62237	TRK VAN EXPANSIBLE										6	6
	X62340	TRK VAN SHOP 2-1/2							1	1		17	19
M816	X63299	TRK WRECKER 5TON 6X6 W/W/E			2	1	2				1	6	12
	X69455	TUBE SOCKET ADAPTER K										2	2
	X92298	VACUUM PUMP RTY PWR D						1				3	4
	Y03104	VEIWER INFRARED AN/PAS-7			14	2							16
	Y14526	VOLTMETER DIGITAL AN/GSM-64									2	6	8
	Y14643	VOLTMETER ELECTRONIC AN/URM-8									2		2
	Y15343	VOLTMETER ELECTRONIC										1	1
	Y15488	VOLTMETER ELECTRONIC										2	2
	Y38404	*TEST SET RADIO FREQ PWR*									2		2
	Y44234	WELDING MACHINE ARC GEN GAS				1							1
	Y48323	WELDING SHOP TRAILER										1	1
	Y54454	WRENCH IMPACT ELEC			7							3	10
	Y67067	WRENCH IMPACT PNEUMATIC										1	1
	Y75239	WRENCH SETSOCKET SQ										1	1
	Z00467	ADAPTOR KIT COMMON TRANSDUCE										2	2
	Z00487	ADAPTOR KIT COMMON TRANSDUCE			6	6							12
	Z01129	ADAPTER TEST ELECTRIC										1	1
	Z10952	BORESIGHT COLLIMATOR										1	1

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 8 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44157J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 63005J4 TOE AUTH	TOTAL TOE AUTH
	[illegible]47	MULTIPLEXER TD-1288/GRC	1	1		0	1	1		8	4	16
	[illegible]115	MULTIPLEXER TD-1289/GRC		1		0	18			1		20
	M35691	METASCOPE AN/PAS-6	2			0						2
	M38609	METER MODULATION ME				0					5	5
	M40253	MULTIMETER DIGITAL ME-510/U				0				1		1
	M51419	MISL SIMULATION RD		146	12	12						170
	M52274	MES BN AID STATION		1	1	1	1	1				5
	M52582	MES ENTRY DEVIVE AN/GSC-21				0	5					5
	M52650	MES DEVICE DIGITAL AN/PSG-2				0	43					43
	M60449	MULTIMETER DIGITAL AN/PSM-4	2	7		0	9		3	5	26	52
	M65673	MICROWAVE FREQUENCY COUNTER				0				1		1
	M66857	MONITORING SET GUIDED MSL SY		4	1	1		3				9
	M68282	MORTAR 4 2IN ON MOUNT		6	6	6						18
	M74364	MOUNT GUN RING CAL 50	2	10	18	18	7	2	4		3	64
	M74526	MOUNT GUIDED MSL LAUNCHER M			3	3						6
	M74755	MOUNT MACHINEGUN ANTIAIRCR				0		6				6
	M75577	MOUNT TRIPOD MG 50 CAL	5	39	6	6	48	42	7	14		167
	M75714	MOUNT TRIPOD MG 7 62 MM		21	2	2	46	31	4	23	10	139
	M80002	MULTIMETER AN/URM-10				0					8	8
	M80242	MULTIMETER AN/URM-22				0					6	6
	M81783	MULTIMETER TS-585/U				0				1		1
	M85475	MULTIPLIER ELECTRICAL				0					2	2
	M98242	MACHINEGUN 7 62MM FIXED RH F		60		0						60
	N02758	NET CONTROL DEVICE NCD KYX-	5	10	26	26	11	6	9	14	5	112
	N04596	NIGHT VISION SIGHT CREW WPN	5	39	16	16	54	48	16	25	6	225
	N04732	NIGHT VISION SIGHT IND SERVE		74	16	16	36	54	2	6	5	209
	N04982	NIGHTSIGHT EQPT THERMING		12	3	3	16					34
	N05050	NIGHT VISION SIGHT SET AN/U		10	2	2	1			12		27
	N15518	NIGHTVISION SIGHT TRIPOD MTD		2	2	2						6
	N17155	OHM METER ZM-21/U				0					2	2
	N20113	OPERATION CNTR COMMUNICATION				0				1		1
	N23721	NIGHTVISION SIGHT-TRACKER I		12	1	1		24				39
	N30572	OSCILLOSCOPE AN/USM-281				0				1		1
	N32160	OSCILLOSCOPE OS-261/U				0				2	[illegible]	[illegible]
	N54691	CHARGER BATTERY 12 & 24 VLT	1	2	2	2	2	[illegible]	43	[illegible]	1	63
	N76466	PEDESTAL INFRARED TRANSMITTE		1	1	1		[illegible]				4
	N82364	PERISCOPE BATTERY CMD				0	1					1
		TOTALS	358	2574	1787	1787	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 9 of 14 pages)

ITEM DESCRIPTION		HHC BDE 87042J410	INFANTRY BATTALION 87345J410	ARMOR BATTALION 17235J410	ARMOR BATTALION 17235J410	ARTILLERY BATTALION 24375J4	ENGINEER BATTALION 75127J4	AIR DEFENCE COMPANY 44147J4	MI COMPANY 34285J4	COMBAT SVC SUPPORT 43095J4	TOTAL
VEHICLE LINE TYPE	NUMBER	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH
	P06148 PLATOON EARLY WARNING SYS AN/		14	14	14					2	44
	P07900 PLOTTING BOARD INDIRECT FIRE		10	10	10				12		42
	P09818 PLOTTING SET ARTY FIRE CONT				8	8					8
	P11208 PLUG IN UNIT ELEC TEST EQPT				0				1		1
	P11866 PNEUMATIC TOOL AND COMPRESSO				0		7				7
	P21220 POSITION & AZIMUTH SYST				0	2					2
	P27819 POWER PLANT ELEC BASE TM 38				0				2	1	3
	P28075 POWER PLANT ELEC,AN/MJQ-15				0	1					1
	P30693 OSCILLOSCOPE AN/USM-488				0				4	6	10
	P31326 OSCILLOSCOPE MULTIMO				0					1	1
	P35573 POWER SUPPLY PP-7540/U				0				2		2
	P37218 POWER SUPPLY PP-1104/G		1		0						1
	P37355 POWER SUPPLY PP-1209				0					1	1
	P38588 POWER SUPPLY PP-2953				0					1	1
	P39956 POWER SUPPLY PP-3514				0					4	4
	P40374 POWER SUPPLY PP-3940/G				0				3	2	5
	P40745 POWER SUPPLY PP-4763/GRC				0			4	1	4	9
	P40750 POWER SUPPLY PP-6224/U				0		8	4	12	25	49
	P40754 POWER SUPPLY PP-6547/U				0				1		1
	P41172 POWER METER TS-3790/U				0				2		2
	P53362 POWER SUPPLY PP-7545/U				0				1		1
	P65040 POWER SUPPLY BATTERY PACK OS				0				4	7	11
	P69002 PROGRAMMER INTERROGATOR SET				0			4			4
	P70517 PURGING KIT FIRE CONTROL		2	6	4	3	4	1			22
	P70871 PROJECTILE ATOMIC 155MM M45				0	3					3
	P81746 PROTRACTOR FAN RANGE DEFLECT			4	4						8
	P91756 PUMP CENTRIFUGE GAS DRVN		2	2	2	2	12	1	2	4	27
	P94440 PUMPING ASSEMBLY FLAM				0					1	1
	P07753 PLOTTING BOARD INDIRECT FIRE				0	15		3			18
	Q03468 QUADRANT FIRE CONT GUNNERS			53	53						106
	Q16110 RADAR SET AN/PPS-5				0				14		14
	Q32756 RADIO SET AN/GRC-106	2			0			10		2	14
	Q34308 RADIO SET AN/GRC-160				0			40		15	55
	Q38299 RADIO SET AN/PRC-77				0					1	1
	Q53001 RADIO SET AN/VRC-46				0			73		21	94
	Q54174 RADIO SET AN/VRC-47				0			11		7	18
	Q54829 RADIO SET AN/				0			2			2
	Q55114 RADIO SET AN/VRC-49				0					4	4
	278782 RADIO SET CONTROL GROUP AN/				0			1		12	13

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 10 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	$	INFANTRY BATTALION HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 87345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127J4 TOE AUTH	AIR DEFENCE COMPANY 44147J4 TOE AUTH	MI COMPANY 34285J4 TOE AUTH	COMBAT SVC SUPPORT 43005J4 TOE AUTH	TOTAL TOE AUTH
	242100	RADIO TELETYP WRITER SET AN/$		0			0				6		6
	099120	RADIO TELETYP WRITER SET AN/$					0	2	3				5
	091302	RADIO TELETYPEWRITER SET AN/$		1	1	1	1				0		4
	811306	ROLLER MINE CLEARING	$			4	4						R
	813838	RADAR CHRONOGRAPH SET M90	$				0	6					6
	814148	RADAR SET AN/TTQ-36	$				0	1					1
	814154	RANGE OUTFIT FLD GASOLINE	$	2	6	10	10	10	12		3	6	59
	830462	RECEIVER -TRANSMITTER CONTRO$		1			0	1		2		2	6
	831561	RECEIVER TRANSMITTER RADIO R$					0				3		3
	834883	RECEIVING SET SPEC PURPOSE A$					0				3		3
	840073	RECEIVER SET COUNTER MEASURE$					0				3		3
	844659	RADIO SET AN/VRC-87	$	1	15	45	45	3	39		1		149
	844727	RADIO SET AN/VRC-88	$		42	12	12	28	38		18	15	165
	844795	RADIO SET AN/VRC-89	$		2	38	38	10	31		10	7	136
	845203	RADIO SET AN/VRC-90	$	2	16	69	69	26	8		40	30	260
	845271	RADIO SET AN/VRC-91	$		38		0	15					45
	845339	RADIO SET AN/VRC-92	$	8	38	5	5	17	1		3	4	R1
	845499	RECEIVER TEST SET TS-3565/TR$					0				1		1
M578	850544	RECOVERY VEHICLE FT LIGHT	$	1	0		0	3			1		5
M88	850681	RECOVERY VEHICLE FT MEDIUM	$		7	7	7		2	1		1	25
	855268	RADIO SET AN/PRC-119	$	3	20	22	22		27			1	95
	855920	REEL CABLE DR-8	$	4			0						4
	856742	REEL EQPT CE-11	$		62	26	26		40				154
	859023	REELING MACHINE RL-31	$	1	1	1	1	8	5	1		3	21
	859160	REELING MACHINE HAND RL-39	$		42	46	46	111	3	87	11	5	351
	859434	REELING MACHINE CABLE MIR DR$		1			0	5	1				7
	861406	RECHARGE/SERVICE KIT	$				0					1	1
	861571	REFRIGERATOR MECH 810	$				0					3	3
	872484	REPAIR AND REFILLING	$				0					1	1
	874787	REPAIRKIT PRINTED CIRCUIT BO$					0				1		1
	880360	REPEATER TELEPHONE TA-287/G$					0		2				2
	884052	REPRODUCER SIGNAL DAT	$				0					1	1
	888636	RESUSITATOR-ASPIRATOR	$	0	8	7	7	1	1			10	34
	893149	RADIO TEST SET AN/PRM-34	$	1	12	5	5	1		2	4	11	41
	901373	SPEECH SECURITY EQPT TSEC K$			254	191	191	139	170	22		69	1101
	901375	SPEECH SECURITY EQPT TSEC K$		22			0				22		135
	910361	SET CONTACT SUPPORT	$				0					3	3
	910682	ROLLER TOWED TYPE VIBRATOR	$				0		1				1
	912575	ROLLER TOWED SHEEPSFOOT	$				0		1				1
	935741	SAW CHAIN GAS DRVN	$				0		36				36
	941465	SIGNAL GENERATOR PULSE SG	$				0				1		1
	948051	SIGNAL GENERATOR SG 1112	$				0				2	1	3
	948187	SIGNAL GENERATOR SG-1170/U	$				0				4	6	10
	961427	SUPPORT EQPT BA	$				0					1	1
	965581	SIGNAL GENERATOR FUNCTION SG$					0				1	1	2

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 11 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	HHC BDE 87042J410	INFANTRY BATTALION 07345J410	ARMOR BATTALION 17235J410	ARMOR BATTALION 17235J410	ARTILLERY BATTALION 06375J4	ENGINEER BATTALION 05127J4	AIR DEFENCE COMPANY 44167J4	MI COMPANY 34295J4	COMBAT SVC SUPPORT 43005J4	TOTAL TOE AUTH
	S67421	SEARCHLIGHT INFRARED				0		8				8
	S68593	SURVEY SET SUPPLEMENTARY EQP				0	2					2
	S69675	SURVEUING EQPT DISTANCE MEAS				0	1					1
	S70027	SEMITRAILER FLATBED				0					7	7
	S70517	SEMITRAILER LOW BED 40 TON			4	4						8
	S70594	SEMITRAILER HVY EQPT 55 TON				0		5				5
	S72024	SEMITRALER STAKE 12				0					5	5
	S72078	SIGNAL GENERATOR AN/USM-47				0				1		1
	S72214	SIGNAL GENERATOR AN/URM-206				0				1		1
	S72983	SEMITRAILER TANK FUEL				0					10	10
	S74832	SEMITRAILER VAN REPAIR				0		1			4	5
	S75175	SEMITRAILER VAN SUPP				0					5	5
	S76723	SEPARATOR OIL AND WATER				0					1	1
	S82704	SWITCHBOARD TELEPHONE				0					1	1
	S83585	SMALL UNIT TRANSCEIVER AN/PR		68	4	4	66	12			8	162
	S99381	SPECIAL PURPOSE DATA-DATA AD				0	54		1			55
	T00013	SHELTER ELECTRICAL EQ				0					1	1
	T00466	TRAINER HANDLING GM LAUNCHER				0			29			29
	T00474	SHELTOR SYS COLLECTIVE PROTE		2	2	2	2	2			4	14
	T04834	TRAINING SET GUIDED MSL SYST				0			4			4
M1009	T05020	TRK UTILITY 3/4 W/E	6		1	1		8	1	23	9	49
	T05741	TESTING KIT PETROLEUM AV				0				1		1
	T06859	TEST SET COMMON CORE STE-M1		6	6	6					2	20
M1037	T07543	TRK UTILITY S250 SHELTER				0	2				7	9
	T10138	SHOP EQPT CONTACT MAINT TRK				0		2		1	6	9
	T10275	SHOP EQPT ELECTRICAL REPAIR				0					1	1
	T13152	SHOP EQPT ORGANIZATIONAL RE				0		1				1
M1	T13374	TANK COMBAT FT 105MM ABRAMS			58	58						116
	T14493	SHOP EQPT GM SYS				0					2	2
	T15584	SHOP EQPT INSTRU				0					4	4
	T15644	SHOP EQPT MACHINE				0					1	1
	T24523	SHOP EQPT ARTILLERY				0					3	3
	T24600	SHOP EQPT AUTOMOBILE				0					1	1
	T25419	SHOP EQPT AUTO M				0					1	1
	T25726	TONE SIGNALLING ADAPTOR TA-9	1	2	1	1	3			2	26	36
	T25457	TARGET DESIGNATOR SET ELECTR				0	14					14
	T29881	TOW SUBSYSTEM TEST SET				0					3	3
	T31784	SHOP EQPT INSTR AMD				0					4	4
	T34437	TRCTR WHLD W/EXCAV FRONT LOR				0		4				4
	T36305	SHOP SET SPARE PARTS				0					5	5
	T36442	SHOP SET SPARE PARTS				0					3	3
M996	T38707	TRK AMBULANCE 2LITTR HMMWV				0		1				1
	T38720	TOOL KIT FIRE DIRECTION ARTY				0	11					11
M997	T38844	TRK AMBULANCE 4 LITTER HMMWV				0	1					1
	T38970	TOOL KITFIRE DIRECTION SYS A				0	1					1

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 12 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	#	INFANTRY	ARMOR	ARMOR	ARTILLERY	ENGINEER	AIR DEFENCE	MI	COMBAT SVC	TOTAL
			# HHC BDE	BATTALION	BATTALION	BATTALION	BATTALION	BATTALION	COMPANY	COMPANY	SUPPORT	
			# 87042J410	07345J410	17235J410	17235J410	06375J4	05127J4	44147J4	34285J4	43005J4	
			# TOE	TOE	TOE	TOE	TOE	TOE	TOE	TOE	TOE	TOE
			# AUTH	AUTH	AUTH	AUTH	AUTH	AUTH	AUTH	AUTH	AUTH	AUTH
M997	T39518	TRK CGO TACT W/W HEMET W/CRA	#				0			2		2
M936	T39586	TRK CGO TACT HEMET MED CRANE	#				0		4			4
	T40405	TAPE READER GEN PURPOSE KOI-	#	5	10	26	26	12	6	6	14	5	110
	T45593	SIGHTBORE OPTICAL	#		2	2	2						6
	T47091	TRUCK FUEL SERVICING 2500 GA	#				0	1					1
	T48944	TRUCK LIFT FORK OED	#				0					5	5
M10A	T49119	TRUCK LIFT FORK 10000LB RT	#				0		1			1	2
	T49255	TRUCK LIFT FORK DSL	#				0					3	3
	T52849	TEST SET ELECTRONIC S	#				0					1	1
	T57366	TOOL KIT TANK TURRET	#				0					21	21
M978 W/	T58161	TRUCK TANK FUEL SERVICING	#				0	1		3			4
	T58456	TOOL KIT FIRE DIRECTION	#				0					1	1
	T58599	TOOL KIT WIRE WRAP	#				0				1		1
HEMET	T59278	TRUCK CGO TACTICAL HEMET	#			9	9	22					40
M1008A1	T59346	TRK CGO 5/4 TON 4X4 W/COMMO	#	2			0		1	1	1	7	12
M1028	T59414	TRK CGO 5/4 4X4 W/E	#	2			0		0	0	1		3
M1008W/	T59482	TRK CGO 5/4 TON 4X4 W/E	#	3			0	1	6	2	5	4	21
	T60073	TOOL KIT GM MAINTENANCE	#				0					10	10
	T61430	TRACKER TEST SET SUPP	#				0					3	3
M998	T61494	TRK UTIL 1-1/4 4X4 HMMWV	#	2	26	18	18	39	33		12	14	164
M1038	T61562	TRK UTIL 1-1/4 4X4 HMMWV W/E	#				0	4					4
M984 W/	T63093	TRK WRK TAC HEMET	#			1	1	1	2	1			6
	T82150	TEST SET NIGHT VISION	#				0					1	1
M978	T87243	TRK TANK FUEL SVC 2500 GAL	#			12	12		4				28
	T87468	TEST SET RADIO AN/GRM-114	#				0				8	5	13
	T90150	TEST SET RADIO FREQ TS379/U	#				0				1		1
M916	T91656	TRK TRACTOR LET 6X6	#		0		0		5				5
	U05008	SPLICING KIT TEL CABLE #6-3	#	1			0	5	4				10
	U06145	SPLINT SET TELESCOPIC SPLIN	#		8		0	1				10	19
	U10378	SPRAY OUTFIT PAINT	#				0					1	1
	U37831	STEREOSCOPE PRISM-MIRROR	#	1	1		0		1				3
	U69083	SURVEYING INSTRUMENT GYRO LI	#				0	1					1
	U69631	SURVEYING SET ARTILLERY FIRE	#				0	1					1
	U70179	SURVEYING SET GN PURPOSE	#				0		1				1
	U81707	SWITCHBOARD MAN SB-22/PT	#	1	8	5	5	13	7	2	2	7	51
	U82529	SWITCHBOARD MAN SB-993/GT	#		17	2	2	12	17	1			44
	V09730	TAGLINE CRANE AND CRANE SHOV	#				0		2				2
	V11001	TAMPER PISTON-HAMMER TYPE EN	#				0		4				4
	V12141	TANK & PUMP UNIT LIQUID DISP	#		7		0	1	1	1	1	2	14
M60A1/A3	V13101	TANK FULL TRACKED 152MM	#			0	0						0
	V19950	TANK UNIT LIQ DISP TRL MTD	#		7		0	1	1		1	4	14
	V29978	TELEPHONE CONNECTING & SWITCH	#				0	4					6
	V30252	TELEPHONE SET TA-1/PT	#		48		0	5	16	4R			117
	V31211	TELEPHONE SET TA-312/PT	#		77	42	42	181	74	47	39	54	535
	V31292	TELEPHONE SET TA 838/TT	#	28			0			1		11	40

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 13 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	INFANTRY HHC BDE 87042J410 TOE AUTH	INFANTRY BATTALION 07345J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARMOR BATTALION 17235J410 TOE AUTH	ARTILLERY BATTALION 06375J4 TOE AUTH	ENGINEER BATTALION 05127 4 TOE AUTH	AIR DEFENCE COMPANY 44157J4 TOE AUTH	MI COMPANY 24295J4 TOE AUTH	COMBAT SVC SUPPORT 43005J4 TOE AUTH	TOTAL TOE AUTH
	V31305	TELEPHONE SET TA-938				0						1
	V36144	COMMUNICATIONS TERMINAL AN/U	2			0				1		3
	V57504	TERMINAL TELEGRAPH AN/TSC-58				0				2		2
	V57729	TERMINAL TELEGRAPH TH-22/TC				0	1			2	1	4
	V57914	TERMINAL TELEGRAPH-TELEPHONE				0	1			4	1	6
	V60460	VOLMETER RMS AN/USM-224				0				2		2
	V61430	TESTFACILITY KIT MG-980/PPS-				0				1		1
	V62406	TEST SET TSEC /ST-23				0	1					1
	V63624	TEST SET ANTIAIRCRAFT ARTILL				0			1			1
	V69258	TEST SET BAT AN/PSM-13	1	6	5	5	1	5				23
	V69532	TEST SET BATERY TS-183/U				0				1		1
	V70539	TEST SET CHEMICAL AGENT				0					1	1
	V71430	TEST SET COMPUTER LOG				0					1	1
	V73959	TEST SET ELECTRICAL CABLE AN				0				1	1	2
	V74738	TEST SET ELECTRICAL POWER AN		1		0						1
	V74875	TEST SET ELECTRICAL P				0					4	4
	V75637	TEST SET ELECTRON TUBE TV-27				0				1		1
	V76108	TEST SET ELECTRON TUBE TV-7	1			0					2	3
	V76519	TEST SET ELECTRONIC C				0					1	1
	V77444	TEST SET FLAME THROWER				0					1	1
	V79430	TEST SET GUIDED MSL				0					2	2
	V84288	TEST SET RADAR AN/UPM-29				0				2		2
	V86014	TEST SET RADAR AN/TPM-23				0			1			1
	V89534	TEST SET RADIO FREQUENCY PWR				0				2	4	6
	V89641	TEST SET RADIO FREQUENCY				0					1	1
	V90972	TEST SET RELAY TS-17				0					1	1
	V91863	TEST SET SEMI CONDUCTOR DEVI				0				3	1	4
	V93094	TEST SET SOIL TRAFICABILITY				0		1				1
	V93233	TEST SET SOUND RECORDER ME-				0				1		1
	V94437	TEST SET TELEPHONE A				0					5	5
	V97069	TEST SET TELETYPEWRITER				0					1	1
	V97417	TEST SET TELETYPEWRITER AN/U				0				1	1	2
	V98788	POWER SUPPLY VEHICLE HYP-57	19	237	188	188	139	44	97	53	48	1114
	W02524	TESTER AIRFLOW	1	7	6	6						20
	W07838	THEODOLITE SURVEY DIRECT				2	3					5
	W27524	TOOL EQPT TE-11				0					1	1
	W27798	TOOL EQPT TELEHONE				0					2	2
	W29714	TOOL KIT TELETYPE EQUIPMENT				0				4	1	5
	W30264	TOOL KIT ARTY MECH				0	2					2
	W32187	TOOL KIT ARTILLERY MECH DS		9	14	14	4	4			24	69
	W32456	TOOL KIT AUTOMOTIVE F				0					3	3
	W32593	SHOP EQUIP AUTO MAINT 01 COM	1	5	4	4	3	3	3		3	26
	W32730	SHOP EQUIP AUTO MAINT & REPA	0	1	1	1	1			1		5
	W32867	SHOP EQPT AUTO MAINT SUPPLEM	1			0		1	1		1	13
	W33278	TOOL KIT BATTERY SERVICE				0			1		2	3

Table G-2. Proposed Equipment for Prepositioning for a Three-battalion Rotation (page 14 of 14 pages)

VEHICLE TYPE	LINE NUMBER	ITEM DESCRIPTION	#	HHC BDE	INFANTRY BATTALION	ARMOR BATTALION	ARMOR BATTALION	ARTILLERY BATTALION	ENGINEER BATTALION	AIR DEFENSE COMPANY	MI COMPANY	COMBAT SUP BATTALION	TOTAL
				97042U410	23345U410	17235U410	[illegible]	24375U4	[illegible]	44167U4	24285U4	[illegible]	
				TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH	TOE AUTH
	W33552	TOOL KIT BODY & FENDER	8				0					2	2
	W33589	TOOL KIT METAL WORKER	8				0					2	2
	W34237	TOOL KIT CANVAS WORKER	8				0					1	1
	W34511	TOOL KIT CARPENTERS PLT CHE	8				0		14				14
	W34648	TOOL KIT CARPENTERS	8	1			0		42	1	3	6	53
	W37251	TOOL KIT ELECTRONIC EQUIP TK	8	0			0				3	2	5
	W37388	TOOL KIT ELEC EQPT TK-105/G	8				0				17	14	31
	W37483	TOOL KIT ELECT EQPT TK101/G	8	1	9		0		9	2	6	8	35
	W37765	TOOL KIT ELECT EQPT SHELTER	8	0			0				1		1
	W37924	TOOL KIT ELECTRONIC MAINT	8				0			4			4
	W38484	TOOL KIT FIRE CONTROL	8				0					10	10
	W39169	TOOL KIT GLASS CUTTING	8				0					1	1
	W39339	WATMETER TEST SET TS-3793	8				0				2		2
	W44512	TOOL KIT MECHANICS	8				0		1				1
	W45060	TOOL KIT GEN MECH	8				0				1	5	6
	W48324	TOOL KIT PIONEER CBT EN PLT	8				0		14				14
	W48348	PIONEER TOOL KIT SQD	8				0		36				36
	W48391	WELDING SHOP TRL MTD	8		1		0		2			1	4
	W50266	TOOL KIT RIGGING WIRE ROPE	8				0		1				1
	W51362	TOOL KIT SERVICE REPAIR REFR	8				0				3	9	12
	W51910	TOOL KIT SMALL ARMS REPAIRME	8	1			0			1	3	8	13
	W57150	TOOL KIT TAPE TRANSPORT TK-8	8				0				2	20	22
	W58075	TOOL KIT WELDERS	8		2	2	2	1				3	10
	W58486	TOOL OUTFIT PIONEER PORTABLE	8				0		12				12
	W60351	WIRELINE ADAPTER, MYX-57-TSE	8	16	18	8	8	160	16	2	20	76	284
	W60998	TOOL SET DIRECT AND G	8				0					1	1
	W65747	TOOL SET VEH FULL TRACKED	8	1	5	1	1	1	5	1	1	2	19
	W67043	TORCH OUTFIT WELDING	8				0		4				4
	W68117	TORCH OUTFIT WELDING & CUTTI	8				0		1				1
	W69529	TOWBAR MOTOR VEHICLE	8				0					1	1
M1	W70473	TRCTR FT HIGH SPEED ACE	8				0		24				24
20E	W74815	TRCTR FT LOW SPEED DSL	8				0		6				6
	W80715	TRACKER INFRARED GUIDED MSL	8		36	2	2		24				44
	W94534	TRAILER BOLSTER	8				0		2				2
	W95263	TRAILER CABLE REEL	8				0		2				2
	W95400	TRAILER CARGO 1/4 TON	8				5			15		3	23
	W95537	TRAILER CARGO 3/4 TON	8		1	1	1	4	2	4	4	13	41
M1068A2	W95811	TRAILER CARGO 1-1/2 TON	8	2	58	20	23	12	44	5	13	22	201
	W96407	TRAILER FLATBED 12TON	8				3						3
M149A2	W98835	TRAILER TANK WATER 400 GAL	8	1	6	2	2	4	4		2	6	26
	W99253	TRAINER LAUNCH EFFECT GUIDED	8		4		2		2				8
	W99534	TRAING SET GUIDED MSL SYS	8		12		2						14
	W99635	TRANSFORMER VARIABLE POWER	8				2				4		6
	W99793	TRANSFORMER VARIABLE	8				2					4	6
	W99873	TRANSMITTING SET INFRA RED	8		1	5	5		3				14

APPENDIX H

SPONSOR'S COMMENTS

STUDY CRITIQUE

(This document may be modified to add more space for responses to questions.)

1. Are there any editorial comments? NO If so, please list on a separate page and attach to the critique sheet.

2. Identify any key issues planned for analysis that are not adequately addressed in the report. Indicate the scope of the additional analysis needed. NONE

3. How can the methodology used to conduct the study be improved? NONE

4. What additional information should be included in the study report to more clearly demonstrate the bases for the study findings? NONE

5. How can the study findings be better presented to support the needs of both action officers and decisionmakers? NONE

6. How can the written material in the report be improved in terms of clarity of presentation, completeness, and style? NONE

STUDY CRITIQUE (continued)

7. How can figures and tables in the report be made more clear and helpful? NONE

8. In what way does the report satisfy the expectations that were present when the work was directed? ANSWERED ISSUE SATISFACTORILY

In what ways does the report fail to satisfy the expectations? NONE

9. How will the findings in this report be helpful to the organization which directed that the work be done?

If they will not be helpful, please explain why not.

10. Judged overall, how do you rate the study? (circle one)

Poor Fair Average Good (Excellent)

APPENDIX I

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GLOSSARY

AAR	After Action Review
ADA	air defense artillery
AMC	US Army Materiel Command
ammo	ammunition
arm	armor
ARNG	Army National Guard
ASL	authorized stockage list
BC	base case
bde	brigade
BFV	Bradley fighting vehicle
BLUFOR	Blue forces
bn	battalion
BOIP	basis of issue plan
CAA	US Army Concepts Analysis Agency
CD	cavalry division
CEWI	combat electronic warfare and intelligence
CIS	core instrument subsystem
CONUS	Continental United States
CS/CSS	combat support/combat service support
cu	cubic feet
DAMO-TRS	Training Support Division, Office of the Deputy Chief of Staff for Operations and Plans
EN	engineer
EQ	equipment
FA	field artillery

FAA	functional area analysis
FMP	Force Modernization Plan
FORSCOM	Forces Command
FSB	forward support battalion
HHC	headquarters and headquarters company
ID	infantry division
INF	infantry
MCA	Military Construction, Army
MI	military intelligence
MILES	Multiple Integrated Engagement System
MPL	mandatory parts list
MTOE	modification table(s) of organization and equipment
NET	new equipment training
NTC	National Training Center
OC	observer/controller
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
OMA	Operation and Maintenance, Army
OPFOR	opposing force
O&S	operation and support
P/L	position/location
PLL	prescribed load list
POMCUS	prepositioning of materiel configured to unit sets
RO	reimbursable orders
SAAM	special assignment airlift movement
spt	support
TMDE	test, measuring, and diagnostic equipment
tng	training

TOE	table(s) of organization and equipment
TRADOC	Training and Doctrine Command
UCOFT	unit conduct of fire trainer
USAARMC	United States Army Armor Center
USAREUR	United States Army, Europe
VCSA	Vice Chief of Staff of the Army

CAA	**NATIONAL TRAINING CENTER PREPOSITIONED EQUIPMENT (NTCPE) STUDY**	**STUDY SUMMARY CAA-SR-87-16**

THE REASON FOR PERFORMING THE STUDY was to conduct a cost analysis to compare the cost of prepositioning M1A1 tanks, Bradley fighting vehicles (BFVs), and combat support/combat service support (CS/CSS) equipment at the National Training Center (NTC) versus transporting from home station.

THE PRINCIPAL FINDINGS of the work reported herein are as follows:

(1) It is more costly to preposition M1A1s at the NTC than to transport from home station.

(2) Training suitability would be improved by prepositioning M1A1s at NTC.

(3) Accelerating planned positioning of BFVs at NTC would provide cost savings.

(4) Prepositioning CS/CSS equipment at the NTC would provide cost savings.

THE MAIN ASSUMPTIONS of this work are:

(1) Operations and support costs for all equipment used at NTC during training exercises will not impact on analysis.

(2) The rate of ammunition usage per battalion and ammunition costs per round will not change during the course of the study.

(3) Forces Command (FORSCOM), Army National Guard (ARNG), and US Army Europe (USAREUR) prepositioning of materiel configured to unit sets (POMCUS) modernization plans will be executed as currently planned.

(4) Single deck railcars, 90 feet in length, will be used to transport equipment to NTC.

THE PRINCIPAL LIMITATIONS of this work are that the study does not address the effectiveness of the training exercises at NTC, the potential impact on readiness, and minor cost elements.

THE SCOPE OF THE STUDY included a review of the current NTC rotation schedule, current and proposed tank fleets for use at the NTC, the scheduled delivery of BFVs to the NTC, and the financial impact of prepositioning a mix of CS/CSS equipment at NTC.

THE STUDY OBJECTIVES were to:

(1) Determine the potential cost savings and training benefits that would be achieved by prepositioning equipment at NTC.

(2) Determine the best schedule for and the quantities of equipment to be prepositioned to achieve cost savings.

(3) Review training schedules and/or possible changes in Army policy to minimize costs.

THE BASIC APPROACHES used in this study were to:

(1) Review the current plan for tanks, BFVs, and CS/CSS equipment for FY 88-91.

(2) Identify alternatives to the current plan.

(3) Develop cost estimates for the current plan and the alternatives.

(4) Identify the most economic options for M1A1s, BFVs, and CS/CSS equipment with respect to transporting or prepositioning this equipment.

THE STUDY SPONSOR was the Deputy Chief of Staff for Operations and Plans, who established the objectives and monitored study activities.

THE STUDY EFFORT was directed by Kenneth R. Simmons, Force Systems Directorate.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-FS, 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.

END

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